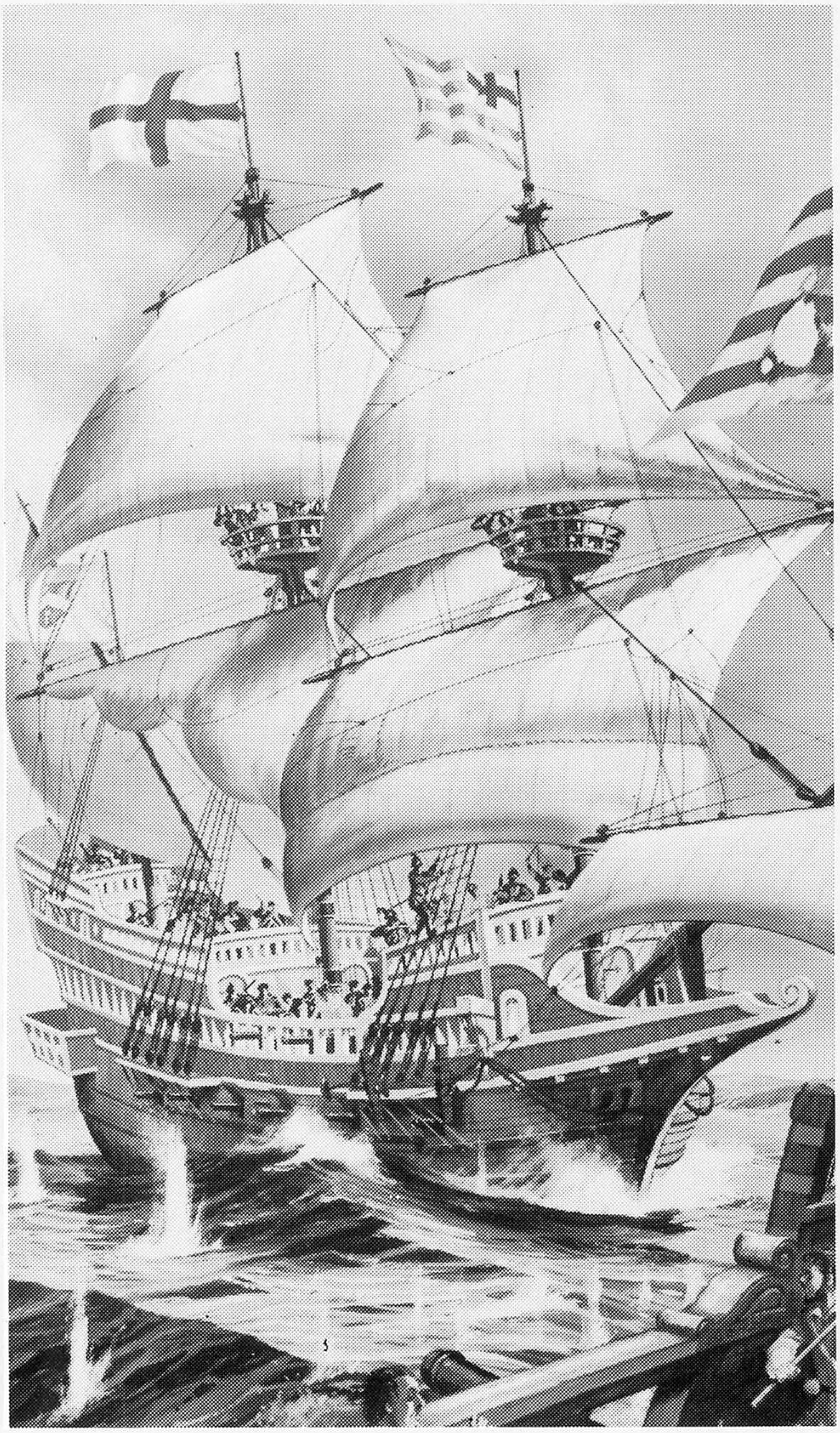
MECCANO MAGAZINE

Vol 63 No. 1
1978 JANUARY £1

WE WISH A HAPPY NEW YEAR TO ALL M. M. READERS

Queen Elizabeth's most treasured ship.



After circumnavigating the world, the Golden Hind returned to Plymouth in September 1580, laden with 30 tons of treasure. The value of the gold, silver and emeralds exceeded the yearly income of the English crown.

Francis Drake had sacked and taken numerous Spanish ports and ships. He was knighted and the Golden Hind became England's most treasured ship.

The Airfix kit of the Golden Hind incorporates most of its' authentic features, thanks to the facts revealed in original documents.

The Airfix model has four deck cannons, fourteen saker five-pounder guns, and the fine detail on the four three-pounder falcons can be seen clearly.

Moulded detail includes the hatches, deck planking and, on the rear, the famous 'Hind' engraving. Full rigging diagrams are included and four anchors of the time are supplied.

On deck, crew members in period costume are depicted about their duties and the figure of Drake stands on the after deck.

All these details and many more are incorporated in the Airfix Kit which, due to painstaking research, is believed to be the most accurate model obtainable of this famous ship.

AIRFIX

MECCANO MAGAZINE

Vol. 63, No. 1 January 1978.

ON THE COVER : Space science-fiction in Meccano! A large model of an 'Eagle Transporter' from Gerry Anderson's spectacular Space television series 'SPACE 1999'. The model was built specially for modern display purposes by Mr. Dave Gunstone of the Model Dept. staff at Binns Road, using a Dinky Toy Eagle Transporter as a constructional guide. Like Mike Nicholls' Atlas Digger featured in the last M.M., this is another example of how toys such as Dinky can inspire the modeller.

EDITOR – CHRIS JELLEY

Well, when I signed off as Editor of the M.M.Q. in October 1976, I little imagined that I would again be putting pen to paper in a similar capacity a year or so later – but here I am!

I am pleased to be back in many ways, especially because editing the M.M. enables me to again become directly involved with the Meccano modeller as an individual person, but I am sorry, too, that circumstances have prevented our '77 Editorial Team from continuing to produce the Magazine. They did an excellent job and I feel that nobody can complain at the quality of their product.

I am personally indebted to Mike Nicholls, not only for the material he will be contributing to our future issues, but for the work he has done on this issue. In fact, Mike's creative flair will be recognised throughout almost the whole magazine and we hope it will be retained in the future.

But, for the M.M. to continue into the future, your active support is needed. Meccano has taken the first step by resuming responsibility for the Magazine (and remember that all outstanding subscriptions are being honoured at Meccano's expense). It is now up to you to ensure continued publication. You can help in a number of ways: (a) by continuing to subscribe to the magazine yourselves; (b) by attracting new subscribers and (c) by providing material for publication in the magazine.

This last point is vital. If Meccano Magazine is to be a *true* Meccano Hobby publication, serving as the unifying focal point for modellers scattered widely around the world, then you, as the modellers concerned, must provide the bulk of the editorial material.

We can speak for Meccano Limited and provide an occasional set of modelling instructions, but it is *your* work, *your* ideas, *your* activities which will keep the Magazine interesting and buoyant. So keep the material rolling into me at Binns Road. Anything will be worthy of consideration, from anecdotes and opinions, through hints and suggestions, to mechanisms and full constructional articles. And don't be put off if you feel that writing "finished" copy is not your strong point. We can knock suitable material into shape if you give us the "meat" to work on. Of course, it may not be possible to publish everything, but we will certainly look at it. The only thing I cannot guarantee to do is to answer all personal correspondence, although I will, of course, try to do so.

Given your support, I am confident that the M.M. will be here for generations to come.

Thanks to the generosity of employees at the Meccano factory, Liverpool's Alder Hey Children's Hospital now has some useful new equipment in the shape of two special chairs for the Burns Unit and two portable television sets for the Isolation Wards. The equipment was bought with money raised from collections and raffles among all Company employees, and it was presented to hospital representatives, at an informal ceremony at Binns Road in December, by Managing Director Mr. George Flynn. Pictured here are, seated, Nursing Officer Eleanor Morgan and Staff Nurse Jacqueline Hargreaves and, standing from left to right, Mrs. Mary Lloyd, Mr. Ernest Russell, Mr. Flynn and Miss Vera Critchley. Mrs. Lloyd, Miss Critchley and Mr. Russell voluntarily organised the collections.

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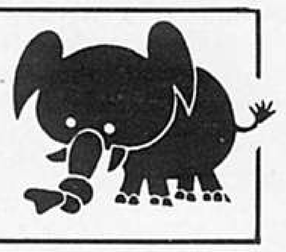

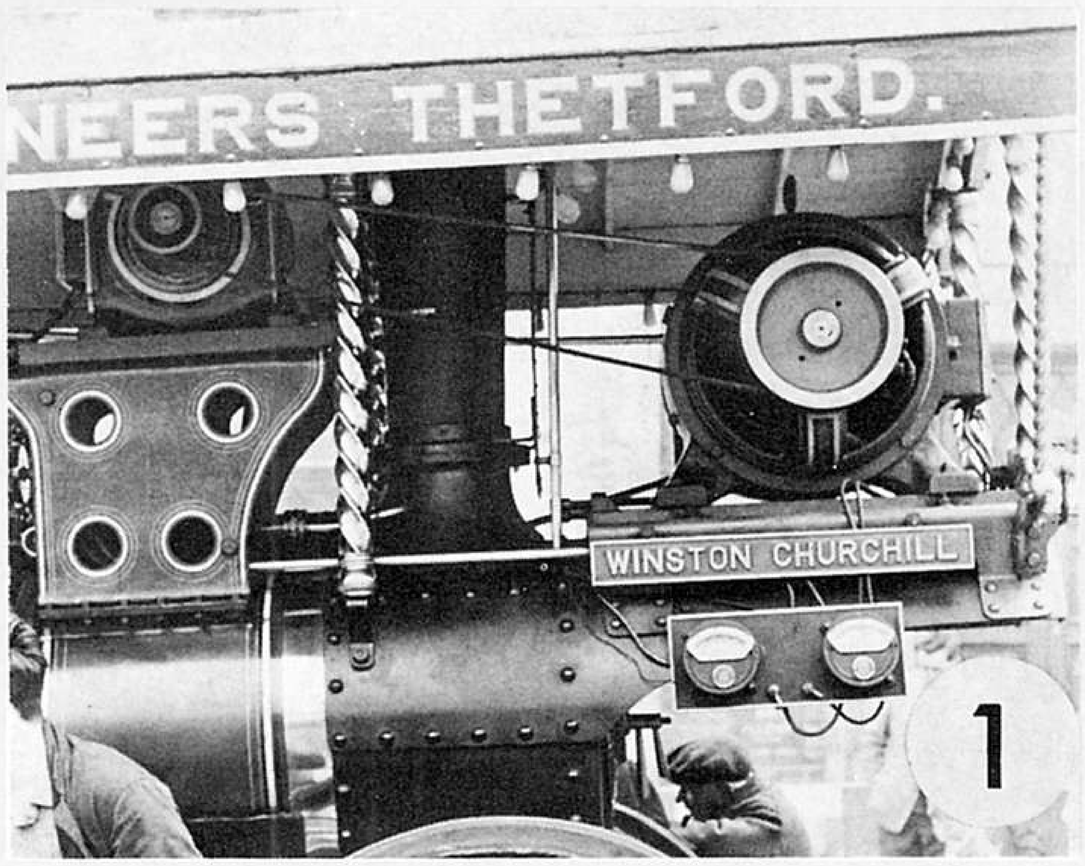

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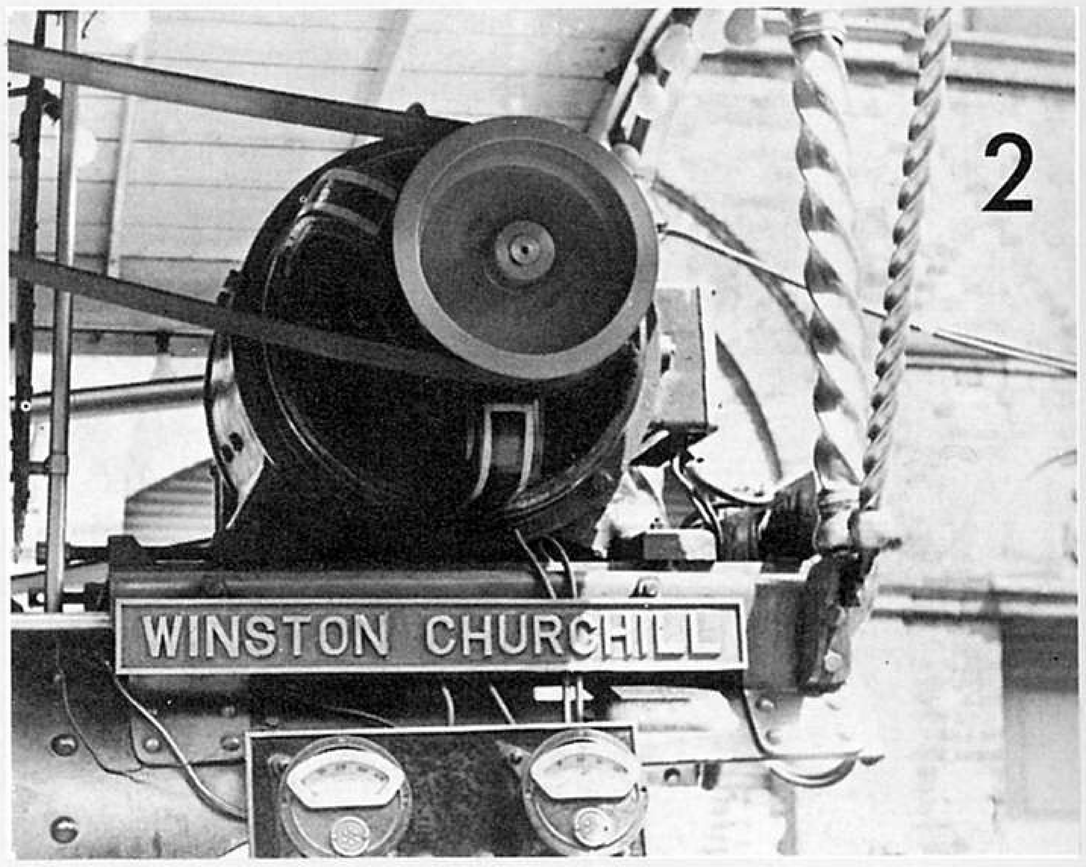

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COLIN HAMILTON looks at DYNAMOS FOR SHOWMAN'S ENGINES

Steam Fairs are a popular hit with the public at large and Meccano enthusiasts in general, and the rides in such a fair should all be driven by individual steam engines built into the gallopers, cakewalks, steam yachts etc if the fair is to live up to its title. However, steam has a number of disadvantages, not least of which are the humping of coal and the time-lag in getting up steam.

As fairground rides became more complicated, the advantages of electrical power were utilized both for movement and illumination. By generating such electricity at a central point and feeding it across the fairground by cable, economy and convenience were achieved.

Normally a Direct Current is required for fairground machinery so that DC motors can be used with speed control circuits. In addition to this, the voltage is commonly about 120 volts (instead of the UK mains standard of 240 volts) as the lower voltage is considered to be below the lethal level in the case of electric shock.

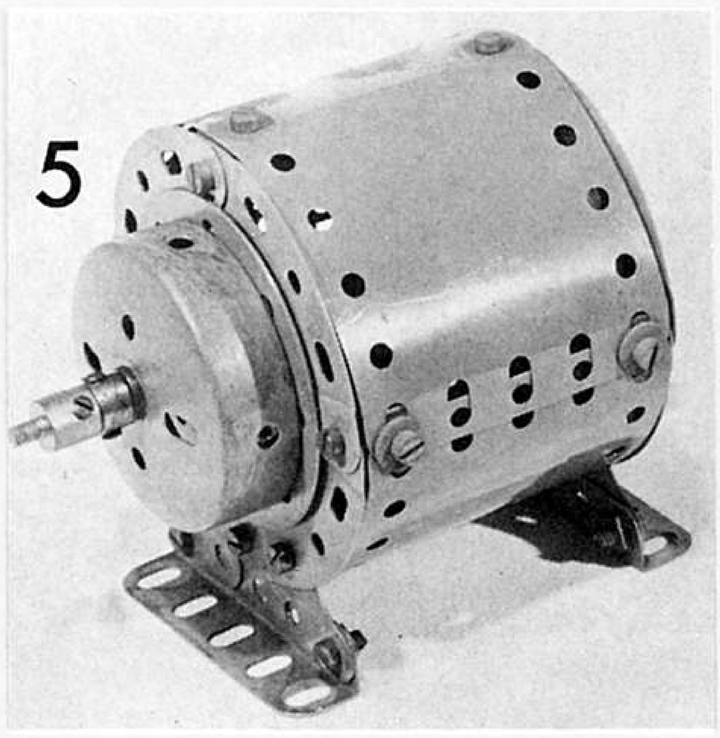
As the steam traction engine evolved into the Showman's Road Locomotive, the role of the flywheel driving agricultural machinery was changed to that of driving a dynamo mounted on a special cantilever bracket extending forward over the smoke box. Hundreds of examples are still seen today thanks to the enthusiasm which has preserved these juggernauts of the steam age, and the most common type is that of a single-unit dynamo often designed to supply the fixed set of 'rides' which that showman's engine towed from fair to fair.

When the heavy-duty compound Burrells came on the scene, their additional horse-power enabled them to drive more powerful generators, but there is a limit to the size and weight of a dynamo which can be carried on a cantilever boiler bracket. In addition to this, the electrical 'load' carried by the dynamo could vary considerably according to the number of fairground rides in operation, their frequency of operation, and the standing load of illumination around the fairground.

Fig 1 shows a method by which this problem was overcome: the famous Burrell showman's engine *Winston Churchill* is shown with two machines on different boiler mountings. The one in the normal place on the cantilever bracket is the main dynamo, and the smaller machine on the saddle bracket is known as a 'field exciter'. Both machines generate electricity, but that coming from the smaller machine is fed to the field coils of the forward dynamo to control the power output against the demand or 'load' of the fairground rides being energized by the showman's engine's dynamo. The smaller 'field exciter' and the main dynamo both have cover plates with instructions showing how machines can be converted from dynamo to motor operation.

The general shots of Figs 1 to 4 show the two dynamos and the arrangements of brackets and belt drives from the main engine flywheel and from the offside pulley of the main dynamo to that of the field exciter. A number of modellers have reproduced this system, and a compact design is shown in the two well-known Meccano Books by Bert Love; on pages 81 and 83 of *Meccano Constructors' Guide* and pages 81 and 82 of *Model Building in Meccano and Allied Constructional Sets*.

Given a little thought and the unorthordox application of standard Meccano parts, it is possible to make dynamos of pleasing and realistic appearance. Taking the simplest form as conceived by the Model Room at Liverpool, Fig 5 shows a rather stark representation which has been used on the large-scale dealer's model of the Meccano Showman's Engine and has very little to commend it as a dynamo. However, as a large number of these had to be produced and assembled with an economy of parts and time, the bare outline served its purpose.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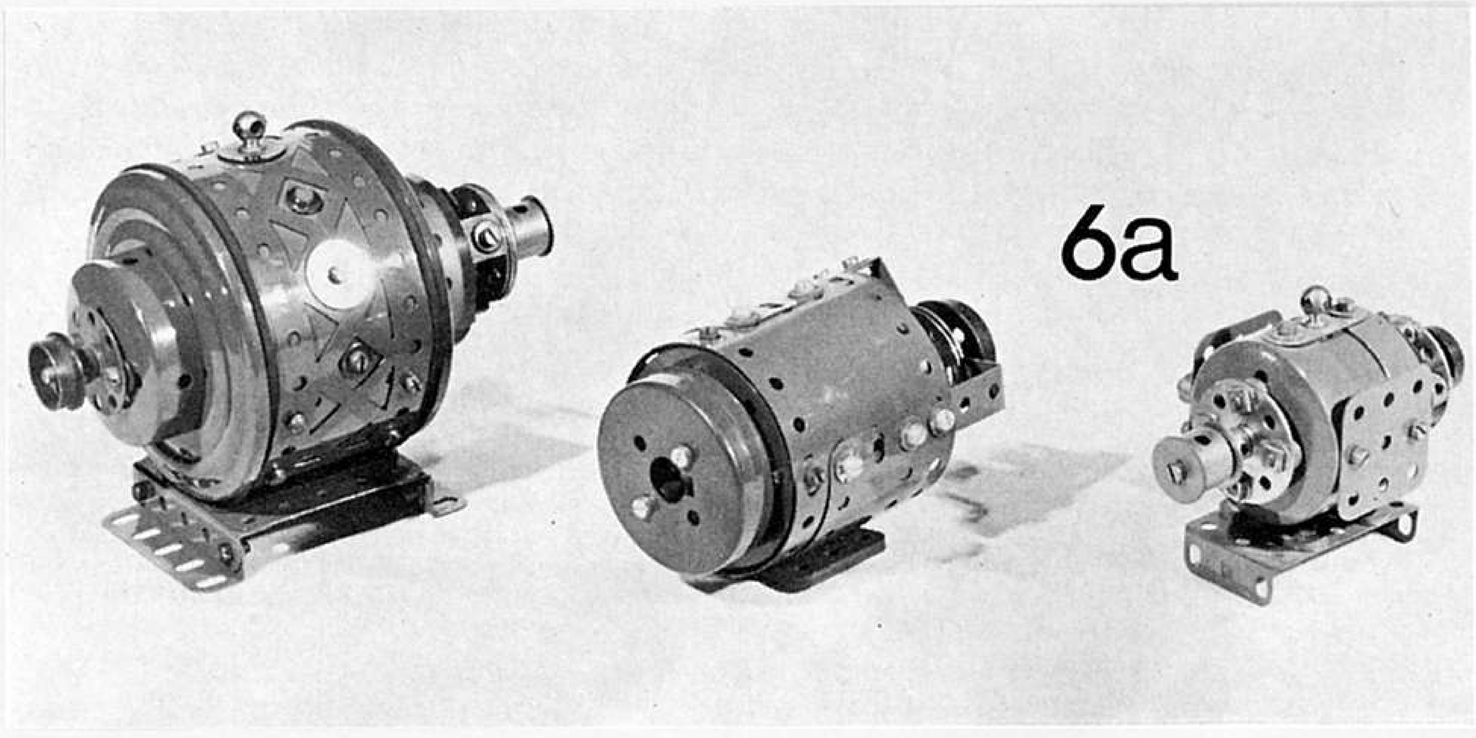
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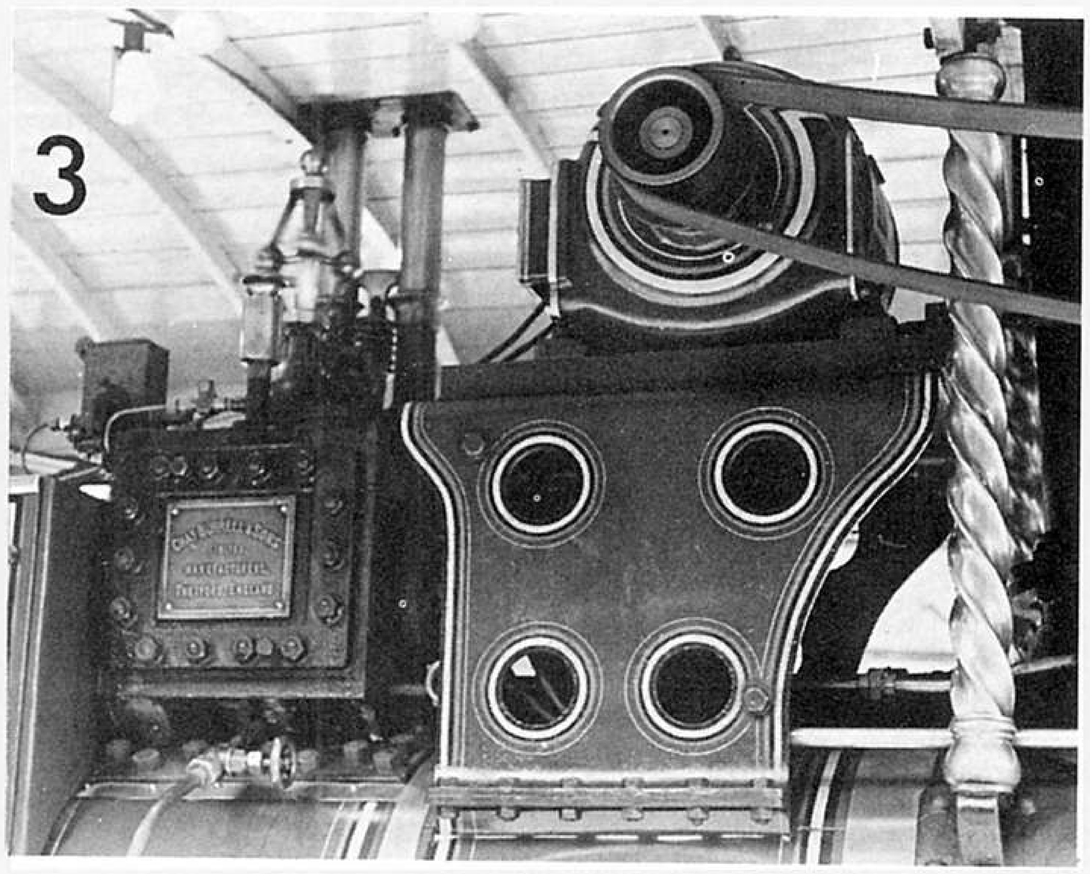
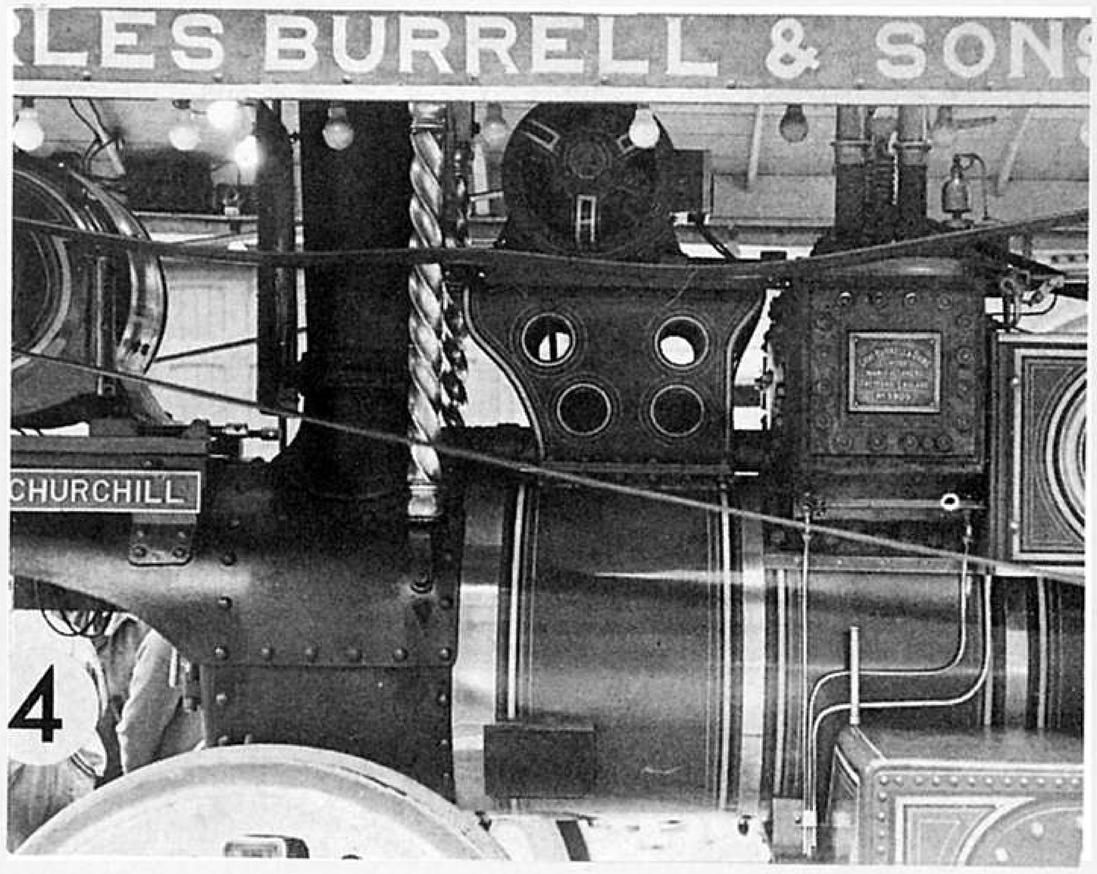




However, as the illustrations in Figs 6a and 6b show, it is not very difficult to make rather more interesting and realistic dynamos from standard parts. The smallest dynamo shown on the right of the photographs is still simple in construction, being two Boiler ends joined by an internal 2½"x1½" Flexible Plate, and the two 1½" □ Plates make a firm reinforcing, at the same time providing a heat shield for proximity mounting by the boiler chimney and, on the front side, a large terminal/dial board simulated by Collars on the middle row and Washers on the lower one.

Some years ago, Meccano Ltd, produced an all-black small Flanged Wheel, and these are worth preserving for use in mechanisms where the 'brassy' look is out of place. One of these is used as the offside back drive on the small dynamo while the main drive pulley is a double-flange type made up as follows. A Rod Socket is fitted with a ¾"Washer and a Chimney Adaptor which is locked in place on the threaded portion of the Rod Socket by a Threaded Boss. This, in turn, allows the outer ¾"Washers to be secured by a standard Bolt. If an antivibration fixing is required here, the outer ¾"Washer should be packed internally with standard or brass shim washers [Meccano Electrical part 561].

It is normally possible to see the bush gear and commutator on a fairground dynamo as one side is of open construction, and this has been achieved in each of the dynamos illustrated here. The medium-size machine on the left in Figs 6a & 6b has its diameter set by one external and one internal Face Plate attached to the external series of four 2½" □ Flexible Plates by Threaded Bosses, and this time the drive pulley is a large Flanged Wheel, also black, having been retained from the days of the 'black' parts.

The largest of the three Meccano designs is shown in Figs 7a & 7b, and its 'brush' gear is almost identical to that of the middle-sized dynamo.

A pair of 6-hole Wheel Discs form the outer bearing plate, and these are stood off from the Boiler End by a combination of 1" x ½" and ½" x ½" Angle Brackets overlaid by electrical Insulating Fishplates [Part 513]. A Socket Coupling forms the 'commutator' in this dynamo, and one end holds a Collar into which a Threaded Pin is inserted through the Wheel Discs so that a drive pulley — built as previously described — can be close coupled to the end bearings.

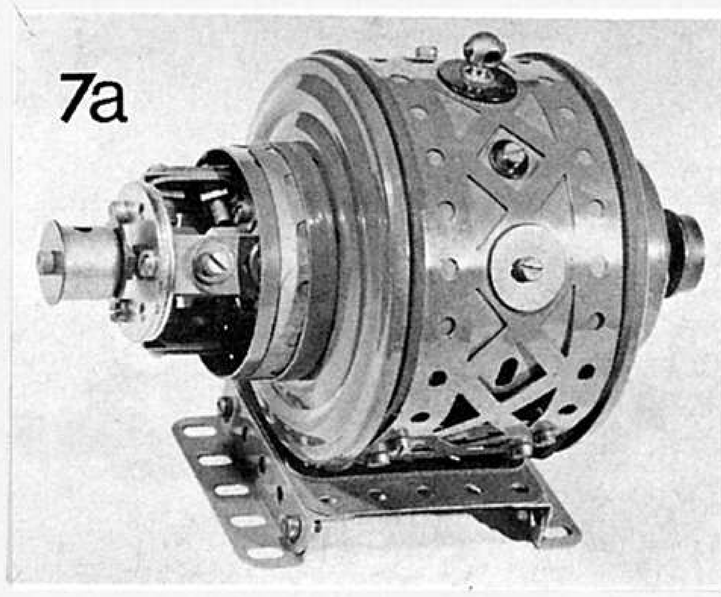
If Meccano bossed wheels are used, they often add that little extra width to the dynamo which makes it unwieldy when mounted on the engine bracket and this can put the dynamo drive right out of line with the flywheel belt. Some ½" Bolts, fitted with brass shim washers are passed through the fibre Fishplates to act as 'brushes' for the commutator.

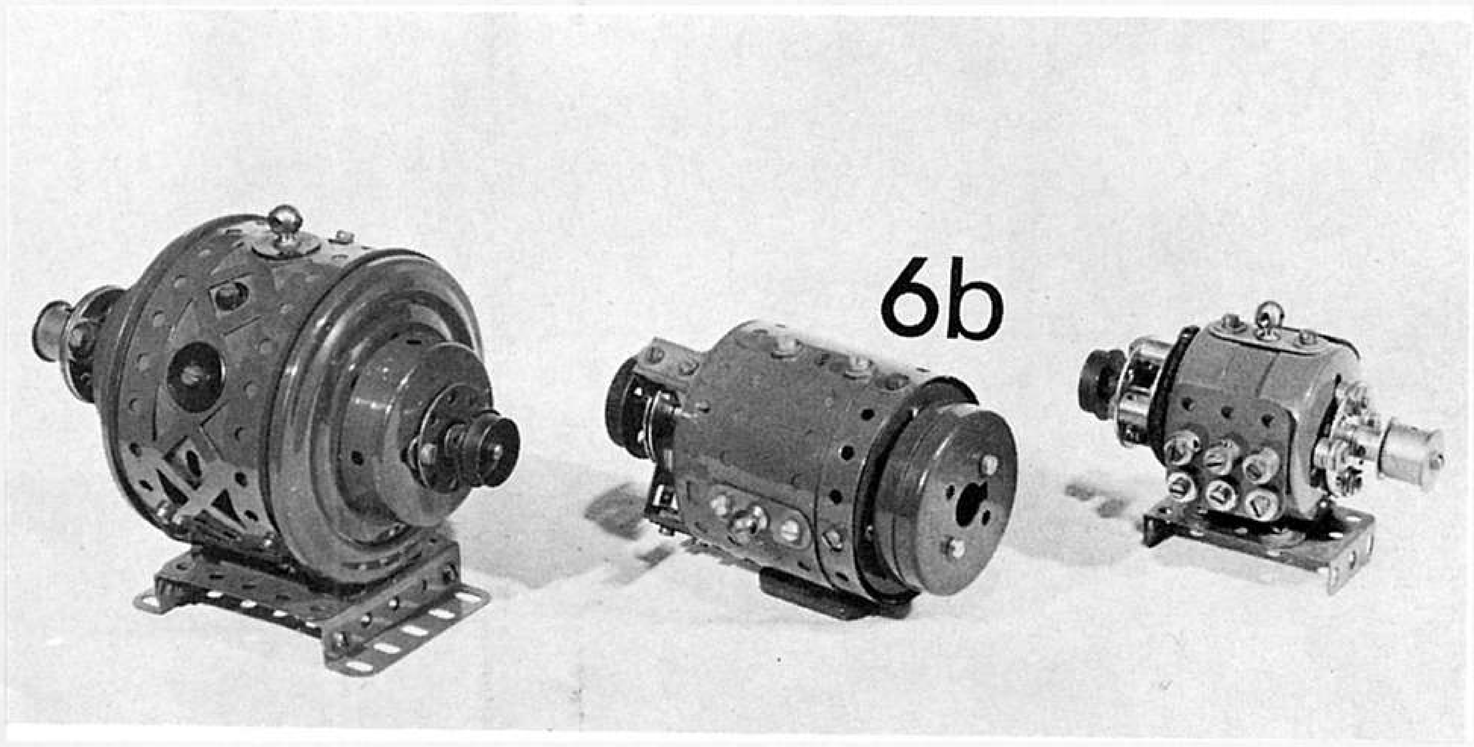
It so happens that a Boiler End will fit inside a Wheel Flange and still leave room for a ring of 2" Brass Flexible Strips [Part 530] to add 'gold line' decoration to the dynamo, and this can be seen in Fig 7a.

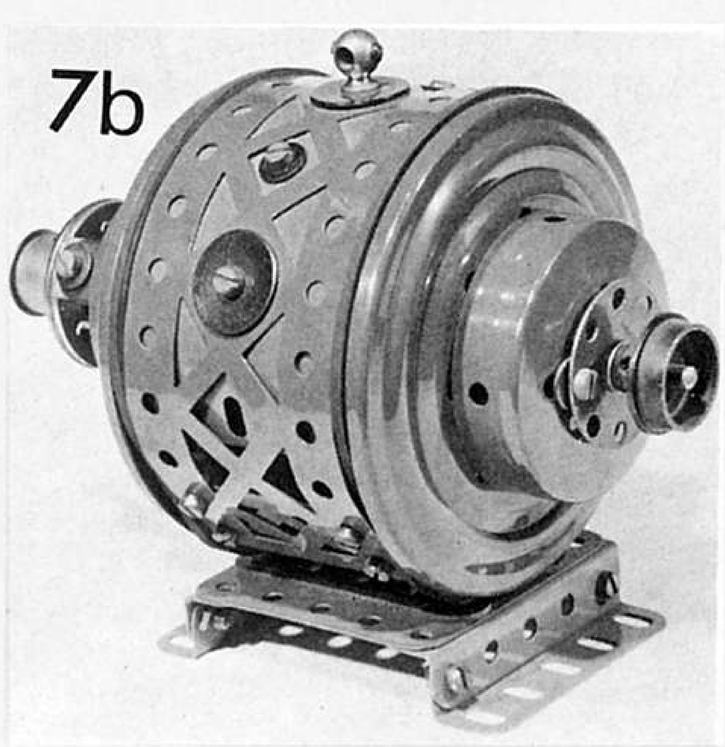
Ball Race Flanges form the outer ends of the dynamo casing, and a combination of internal Threaded Bosses and Threaded Rods hold these end plates together, at the same time trapping a 7½"Strip Plate curved between the Flanged Rings. A 12½" Braced Girder (obsolete pattern) adds decoration and coverage to the dynamo case with holes filled in with Washers, and a neat capping is provided by a Handrail Support.

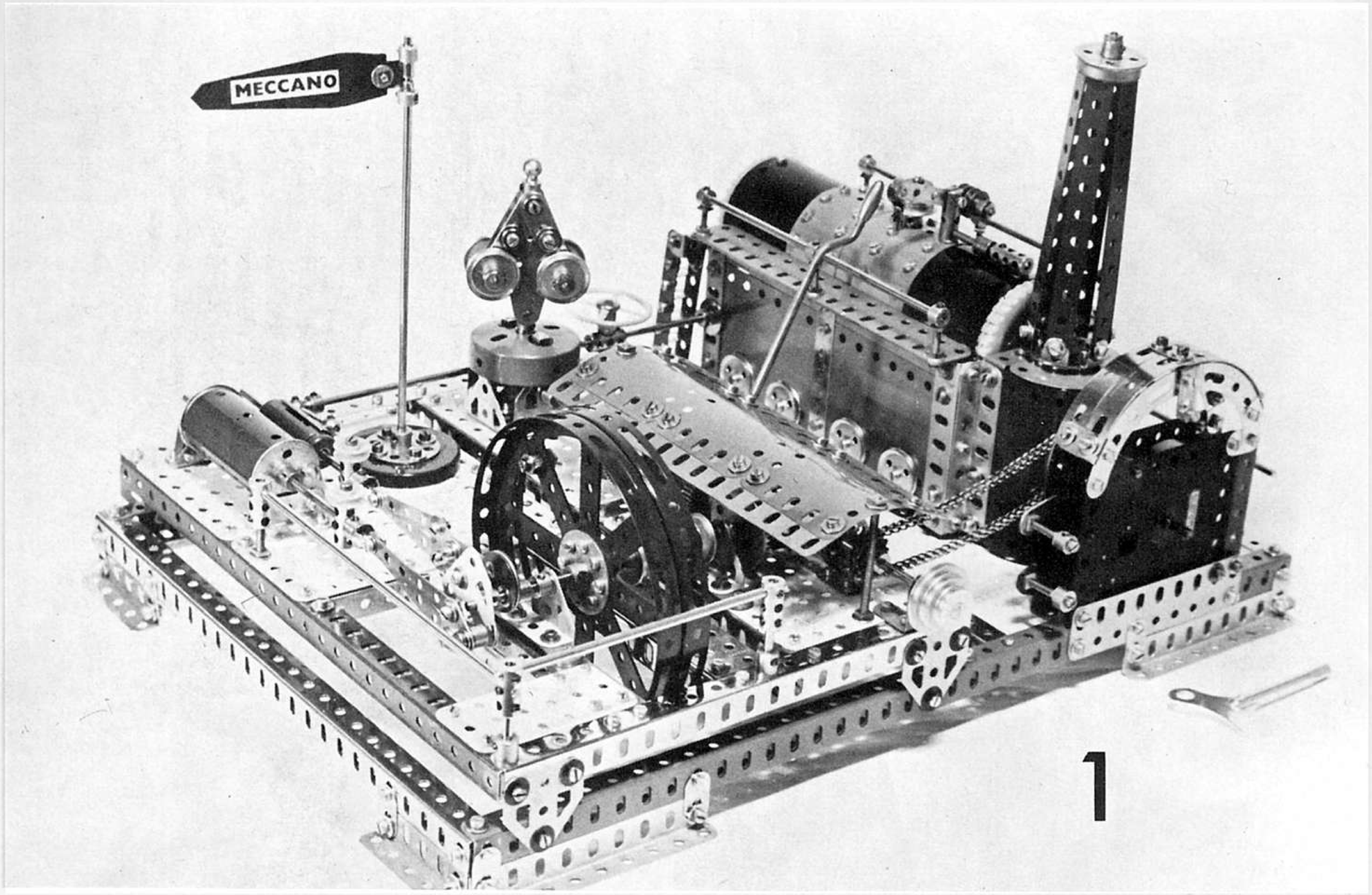
The object of this article is to get Meccano modellers thinking about the application of standard parts in unorthodox places to exploit the system to a wider degree. The human eye resolves detail better than the finest camera, and the observant modeller can re-create prototypes to a suprising degree of realism, as is shown by the superb Meccano models which grace the various club displays and exhibitions to which we are accustomed today.

Even the humble rubber band has a place; note that an otherwise ugly row of holes would show on the inner Strip Plate used for the large Meccano dynamo, but a pair of 10" Heavy Driving Bands are placed round the frame — just touching the rim of the Ball Race Flanges — and this adds the finishing touch!









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STEAM POWER PLANT

This model must be one of the most attractive to come from that genius of Meccano, Andreas Konkoly. As can be expected of Andreas' designs, high-quality workmanship is evident throughout.

A large boiler house — with an openable door, ladders, walkways with handrails, and eight representational side vents — is crowned by a boiler with 'steam whistle' and 'safety valve', and a chimney.

A single cylinder is connected to the flywheel, whilst a valve rod is actuated via an eccentric on a crankshaft that is capable of forward and reverse running.

The speed of the model may be regulated by the use of a 4-speed gearbox in connexion with a compact, heavy centrifugal governor. A shaft from the gearbox is provided with a Cone Pulley in order that another model may be driven from this unit.

A representational steam pipe runs from the boiler to the small cylinder, and a regulating wheel is supplied by a small Steering Wheel on the 'pipe'. The Clockwork Motor supplying the drive has its side-plates extended by a built-up 'roof', and this — together with railings and a 'Meccano' pennant — adds the finishing touches to a very attractive and compact model.

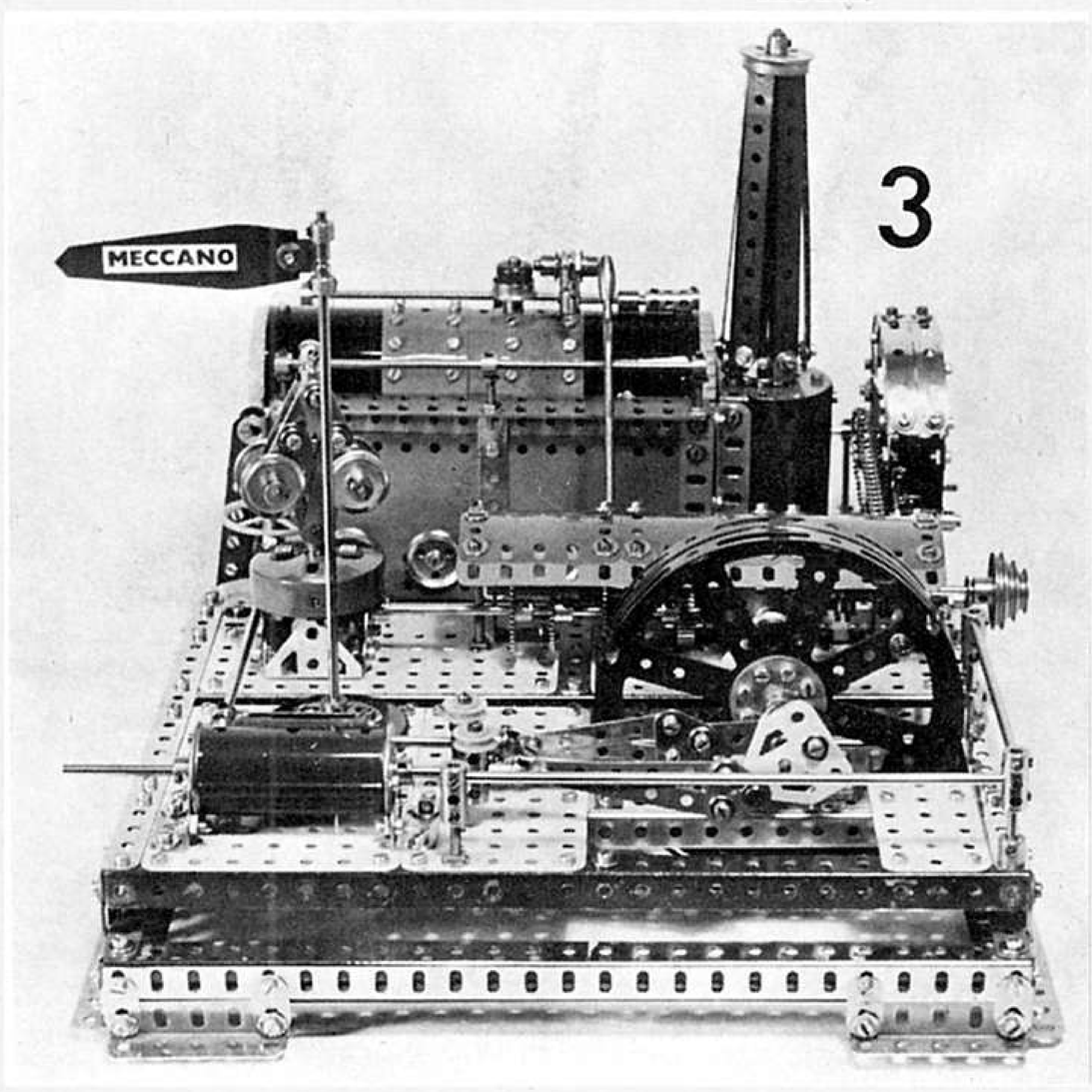
An Electric Motor for continuous running may easily be fitted instead of, or in addition to, the Clockwork Motor illustrated. A Motor-with-Gearbox may be fitted on the Angle Girders on the base which lie between the boiler and the gearbox. A Motor thus fitted should be raised on Collars.

BUILDING INSTRUCTIONS

THE FRAME

Figs 4 & 5: The frame is constructed as shown from four 12½ and four 18½" Angle Girders. The legs are four 2½" and four 4½"Angle Girders, each held to the frame by two Fishplates. Four ½"x½" Angle Brackets brace the corners as shown in Fig 5.

Within the basic frame, cross members



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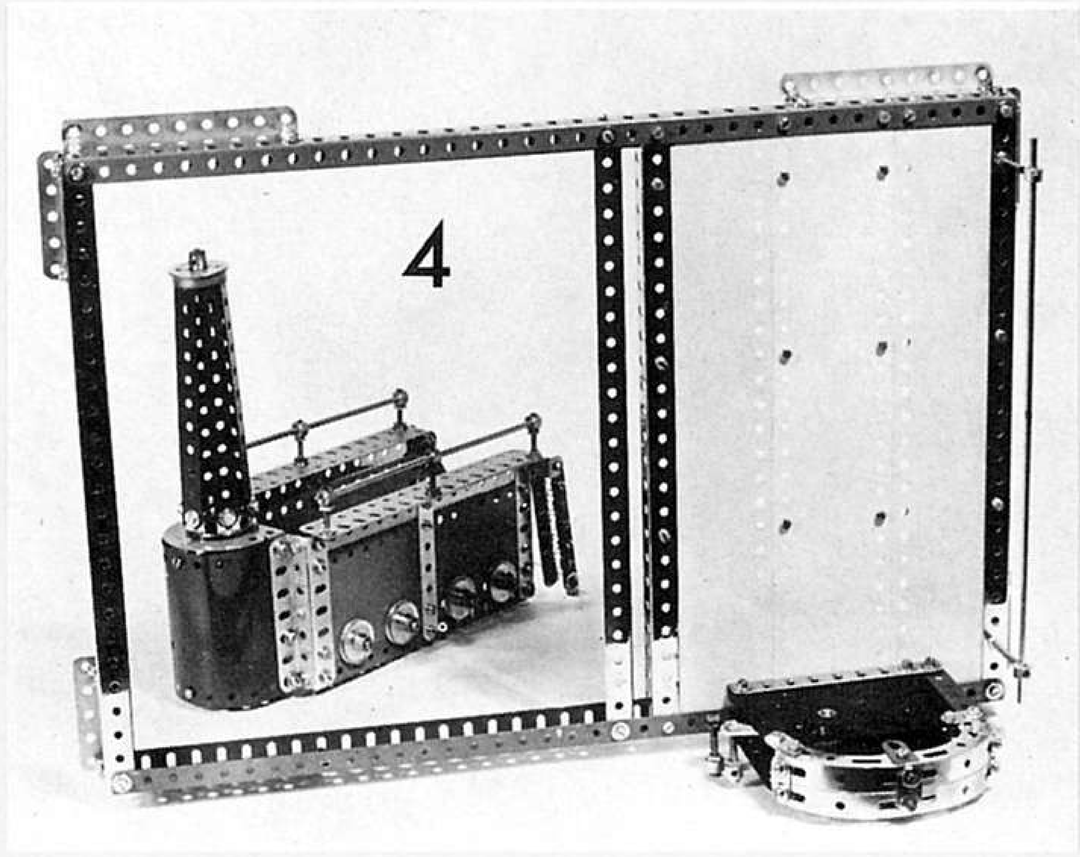

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are provided by two 12½"Angle Girders, one of which helps support three 7½" Strips, which in turn support three 12½" Strip Plates as shown.

THE BOILER HOUSE

Figs 1, 2, 3, 4, & 5: The lower long sides of the boiler house are two 7½"Angle Girders with their slotted flanges facing inwards. The upper long sides are identical, except that the slotted flanges face outwards. Four 3½"Angle Girders form the vertical corners. A 3½"Strip braces the bottom of each end, whilst two 2½"Stepped Curved Strips brace the top farthest from the chimney end. A 3½"Narrow Strip adds extra support just below the Curved Strips (see Figs 2 & 5).

The sides are filled in with 7½"x2½" Strip Plates with 3½"Strips placed vertically in their centres as shown.

Fig 2 gives a good view of the openable 'leaf' door, which consists of two Hinges supporting a 2½"Flat Girder on which is mounted two ½"loose Pulleys by two Handrail Supports to form a door handle.

The side vents (Figs 1 & 2) are four 1" loose Pulleys on one side, and four 1" Pulley-with-Boss held by 19mm Bolts on the other.

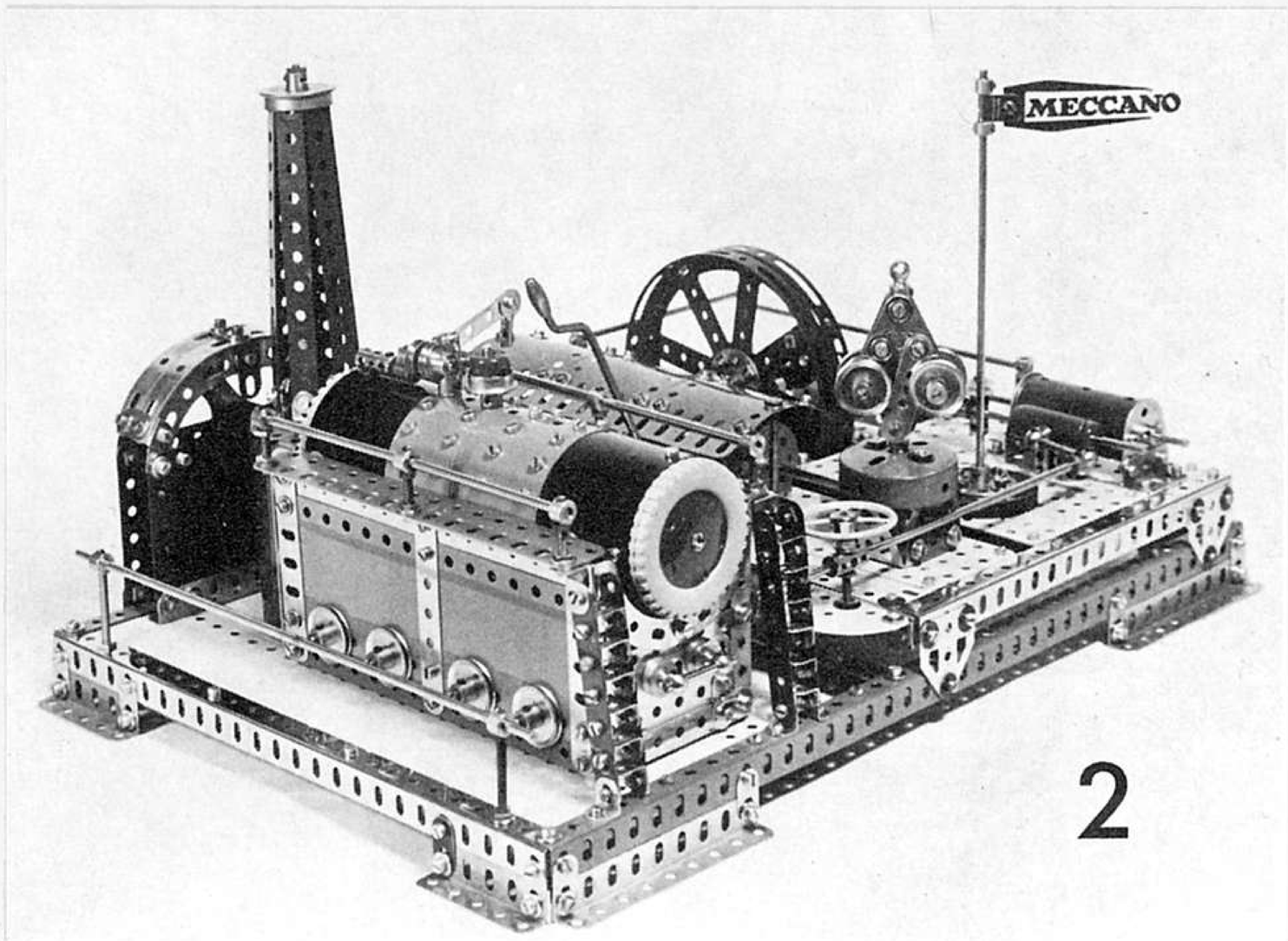
In the corner holes on the lower frame of the boiler house, four Bolts are fixed with Nuts as shown in Fig 5 to allow connexion to the Strip Plates on the base.

THE CHIMNEY

Figs 4, 5, & 6: The chimney 'house' consists of two vertical 3½"Angle Girders, attached to the boiler house, and supporting two 5½"x2½"Plastic Plates curved as shown. On top of this assembly, a 2½"x½"Double Angle Strip braces the chimney house, and a Semi-Circular Plate is fixed to this D A Strip by a 1½"Flat Girder (hidden below the Semi-Circular Plate in Fig 4, but an identical arrangement makes up the bottom of the chimney house and is shown in Fig 5). A ½"x½"Angle Bracket supports the Plastic Plates at the front of each Semi-Circular Plate.

Another pair of 2½"Curved Stepped Strips brace this end of the boiler house, and they carry a ½"x½"Angle Bracket (pointing away from the chimney house) to support the boiler when added later.

The chimney itself consists of a 6-hole Wheel Disc with a ½"x½"Angle Bracket fixed to each perimeter hole by their round holes. To each slotted hole of the Brackets is fixed a vertical 5½"Strip. An



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8"Threaded Rod lock-nutted to the centre hole of the Wheel Disc, serves to hold the chimney cap, which is a large Flanged Wheel.

THE WALKWAYS

Fig 4 shows details of the walkways which are 7½"Flat Girders. The handrails are two 3½"Rods, held in Collars supported by 19mm Bolts.

The ladders are shown in Fig 2 . Both have two 3½"Strips as their side members. The 'rungs' of the left-hand ladder are six ½"x½"Double Brackets, whilst those of the right-hand ladder are one ½"x½"Double Bracket above five ½"x½"Angle Brackets. The left-hand ladder is secured by a [154a] Right-hand Corner Angle Bracket at the top, and a ½"x½"Angle Bracket at the bottom; whilst the right-hand ladder is secured at the top by a [154b] Left-Hand Corner Angle Bracket, and two ½"x½"Angle Brackets at the bottom.

THE BOILER

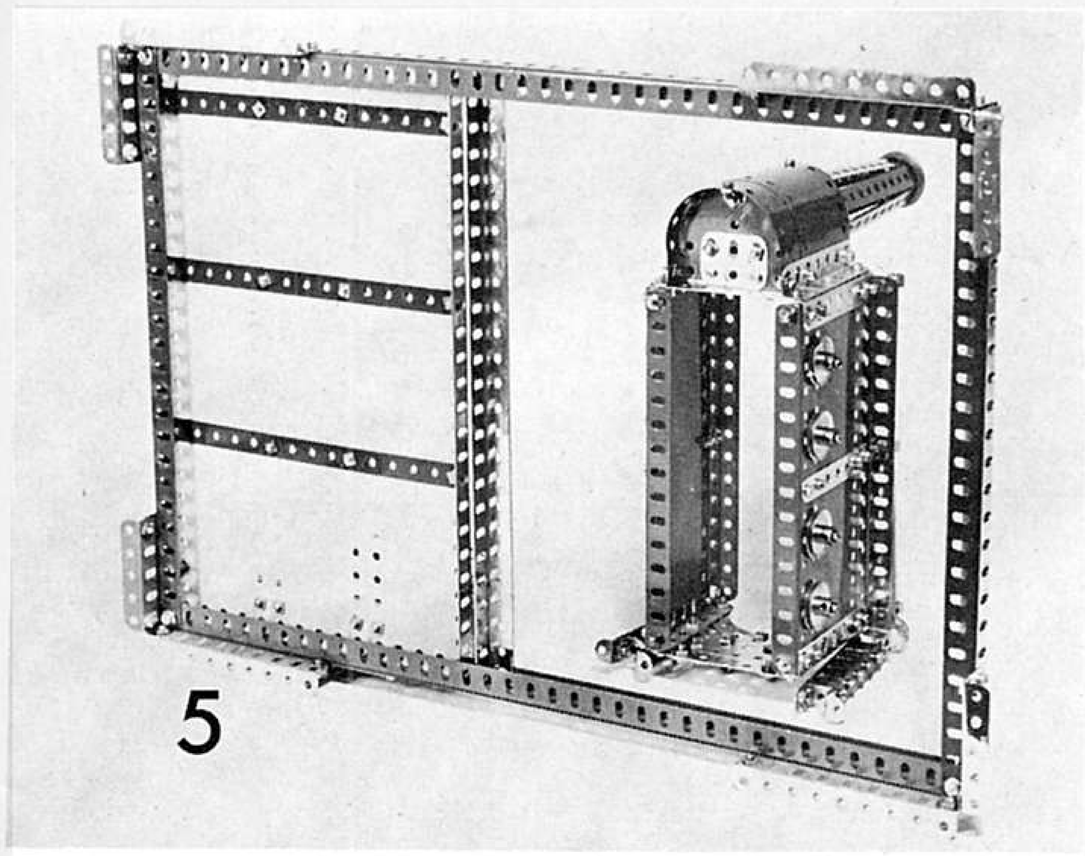
Figs 1, 2, 3, 6, 7, & 8: One extreme end of the boiler side is formed of two 4½"x2½" Plastic Plates joined as shown. Now follows a 5½"x1½"Plastic Plate plus a 5½"x1½"Transparent Plastic Plate (see Figs 6 & 8).

A No187 Road Wheel is fitted with an 8"Rod, and pressed into the built-up boiler half to form one of the boiler ends. A Face Plate is passed over the 8"Rod and firmly fixed against the Bolts of the 5½"x1½"Plastic and Tranparent Plates: this provides the former for the boiler shape.

The two halves of the boiler will be connected by two or more 5½"x1½" Plastic Plates as shown in Fig 8, and these should now be fitted to the assembled half.

Now, the other half of the boiler can be completed in exact mirror-image of the first half, with another Face Plate being positioned before the pair of 4½"x 2½"Plastic Plates are finally fitted. Another Road Wheel forms the second boiler end. The 'safety valve' and the 'whistle' should be constructed and installed as work on the second half of the boiler progresses. →

Designed by Andreas Konkoly and described by "SPANNER"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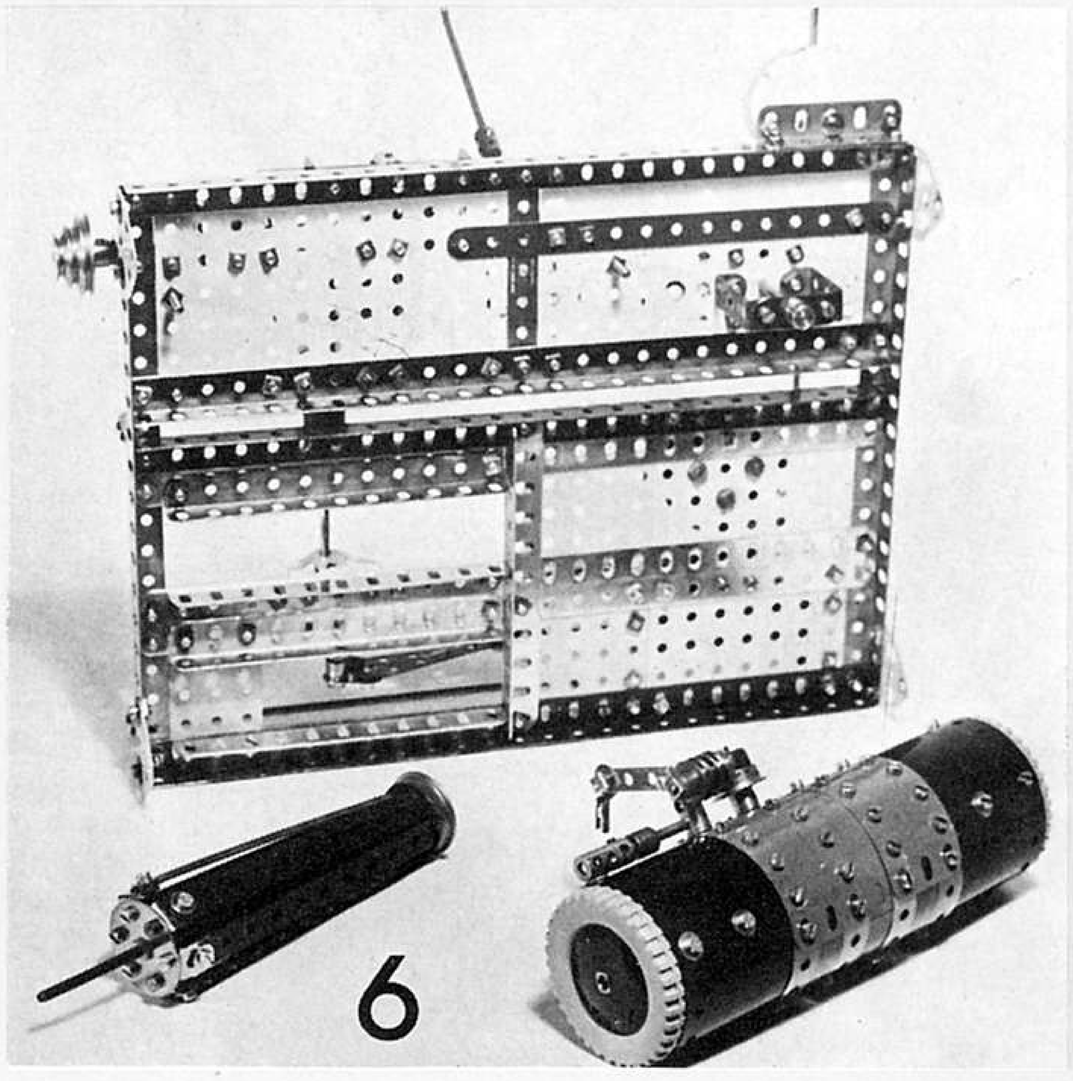
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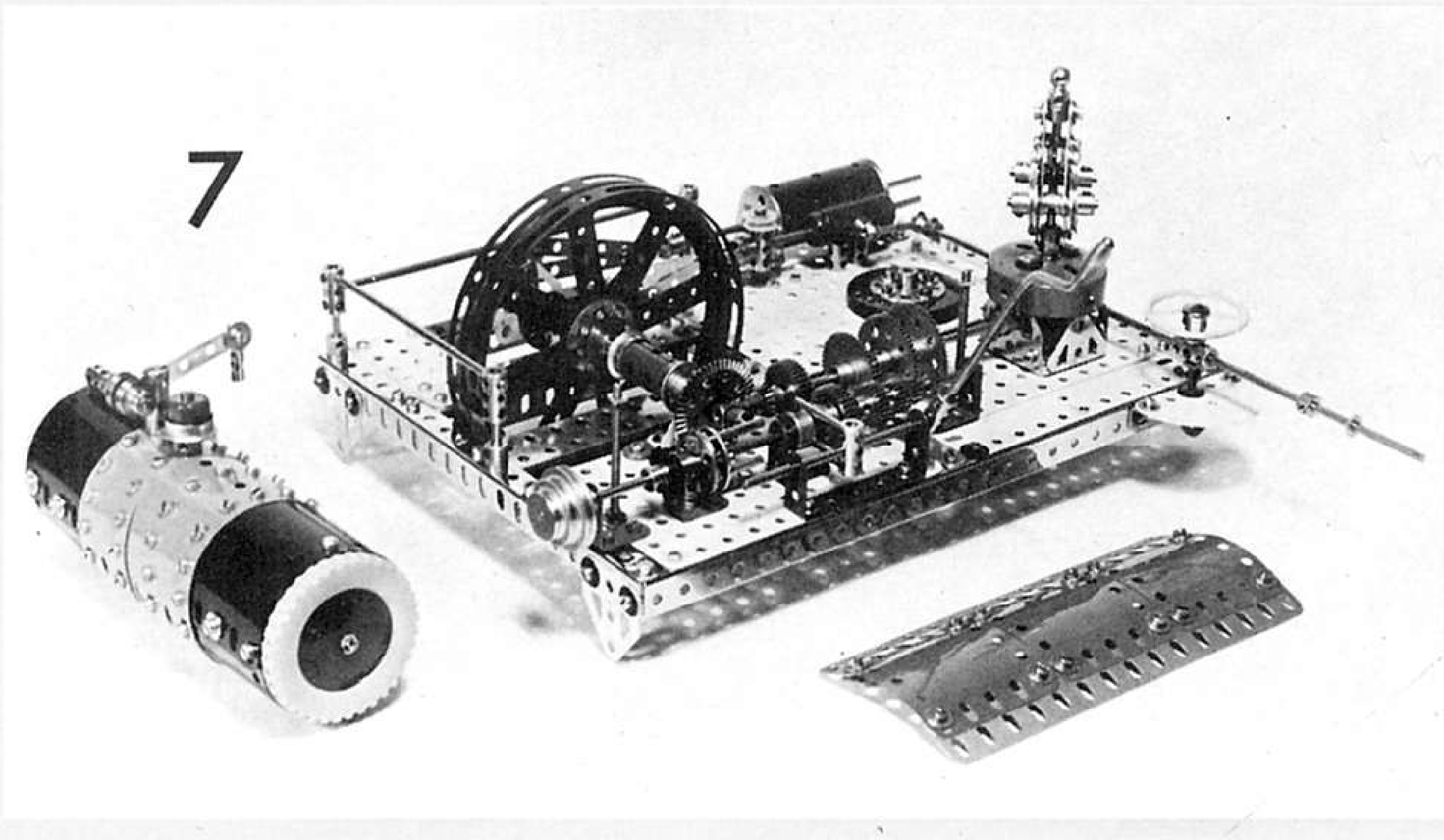


THE 'SAFETY VALVE'

Figs 2 & 7: This fitting consists of a Chimney Adaptor fitted inside a small Flanged Wheel, and held to the boiler top by a central 28.5mm Bolt.

THE 'STEAM WHISTLE'

Figs 2, 6, & 7: A Strip Coupling has a 2½" Narrow Strip fitted in its slot as shown, and this Strip carries a counterweight, represented by a 28.5mm Bolt on which is placed in order: a ½"Pulley-with-boss, a Washer, the end hole of the Narrow Strip, another Washer, another ½"Pulley-with-boss, and finally, a Nut.

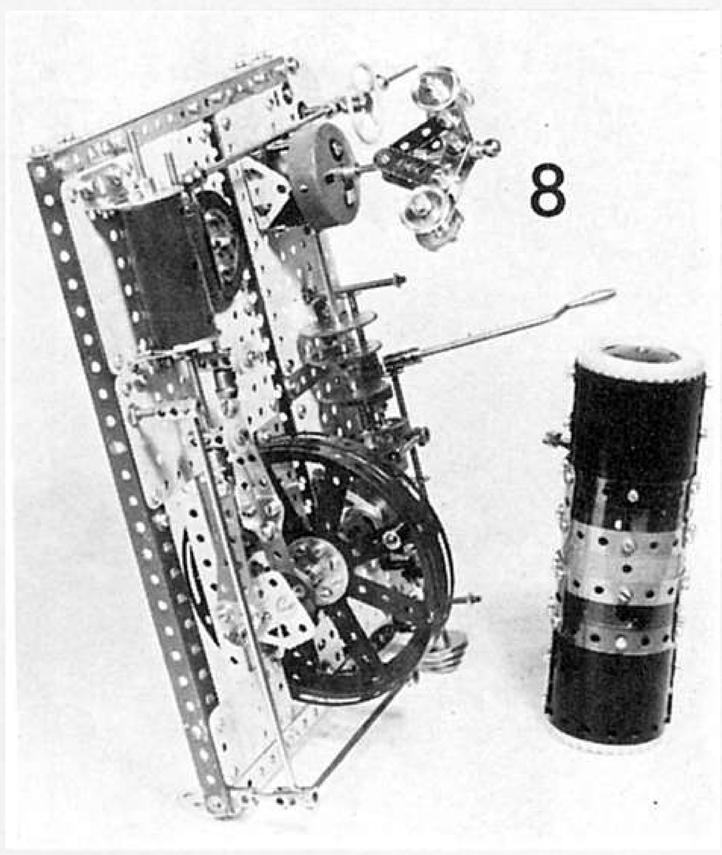
On its other end, the Narrow Strip carries a Rod and Strip Connector on a Bolt that is lock-nutted to the end hole of the Strip so that the Connector is free to swing.

The Strip Coupling is fixed to the boiler top by a short Threaded Pin — or a Bolt from inside the boiler — and a Washer is used as spacing. A 9.5mm Bolt passes up through the end top hole of the boiler, and secures a Coupling, spaced from it by the necessary number of Washers. In the Coupling is mounted a new-style (shoulderless) Threaded Pin (or a 1"Threaded Rod if such a pin is not available). This Pin serves to extend the Coupling with a Screwed Rod Adaptor, the 'point' of which *rests against* the Strip Coupling. Any portion of the Pin/Threaded Rod left showing after adjustment may be sleeved by Washers.

FITTING THE BOILER

The boiler is now placed in position, where it is retained by virtue of the walkway Flat Girders pressing on the Bolt heads on the side of the boiler.

The boiler-house-and-boiler unit is now bolted to the base frame in the position shown.



THE MOTOR

Figs 1, 2, & 4: Firstly, a 4½"Flat Girder is attached to the side of the base frame as shown in Fig 1, then, to the three Strip Plates, a 4½"Angle Girder is fixed, and between these, the No1 Clockwork Motor is fitted. Any resulting gaps should be spaced with Washers.

The Motor sideplates are extended with a pair of vertical 3"Strips, each joined to the top of the Motor by Fishplates. Four 3"Stepped Curved Strips serve to form the arched 'roof' of the motor, and these support four Formed Slotted Strips as seen. Two 1"x½"Angle Brackets support the structure in the centre, and three Fishplates hold the assembly together at '10, 12, and 2 o'clock'. Four ½"x½"Angle Brackets hold the Curved Strips to the end of the Formed Strips.

A Bolt lock-nutted to the lower hole of the external 1"x½"Angle Bracket serves as a hook for storage of the Motor winding key.

On the drive shaft of the Motor, a 1" Sprocket Wheel is fitted, and on the operating levers of the Motor, Collars on 28.5mm Bolts act as handles (see Fig 1).

THE PLINTH

The remainder of the model is set on a raised platform or plinth, the construction of which is as follows: Referring to Figs 1, 2, 3, 6, 7, 8, & 9: Four Flat Trunnions support the frame which is made from two 12½", and two 9½" Angle Girders (Fig 6). Within these are two 12½"Angle Girders and two 12½" Flat Girders arranged as shown (horizontally) in Fig 6.

The *narrow* part of the plinth is now filled in with the following: a 5½"x3½" Flat Plate, a 5½"x1½"Flexible Plate, and a 3½"Strip. A 7½"Strip braces the underside as shown.

Infilling of the *wide* part of the plinth is by a 3"x1½", a 5½"x2½", and a 5½"x 3½"Flate Plate, whilst underneath they are braced by four 5½"Angle Girders in one direction, and one 5½"Angle Girder at right angles to the four.

THE CRANKSHAFT

Figs 1, 7, 8, & 9: On the edge of the narrow part of the plinth (Fig 9) is fixed a Trunnion spaced by three 2½"Strips. On the centre of the wide part of the plinth, a similar arrangement is placed, but this time with five 2½"Strips as spacing. A 6½"Axle Rod is placed in the bearings thus formed, and this Rod carries a Double Arm Crank fitted with a Flat Trunnion, and a Single-Throw Eccentric as shown. A Collar and a Washer next to the lower (on Fig 9) supporting Trunnion limit Rod travel.

The flywheel comes next on the Rod. It consists of a pair of Hub Discs fitted back-to-back and clamped by a pair of 8-hole Bush Wheels. This is followed by an ornamental feature made up of a Sleeve Piece held between two small Flanged Wheels [this arrangement is not possible with modern cast Flanged Wheels, and may be omitted if pressed Wheels are not available].

Two Washers follow the supporting Trunnion, and these are in turn followed by a 1½"Bevel Gear. Referring to Fig 7, it can be seen that the Bevel Gear is followed by a Washer, a Coupling, another Washer, and a final Collar.

The flywheel carries a Nut and a 12mm Bolt fitted with a Collar and a Washer on each side of the spoke to which it is fitted. This assembly acts as a counterweight, and care should be taken later to ensure that this fitting is at the top of the flywheel when the end of the connecting rod is at the bottom, as shown in Fig 8.

THE VALVE CYLINDER

Figs 1, 7, & 9: Two vertical Short Couplings (Fig 7), held on 19mm Bolts, serve as supports for a horizontal Sleeve Piece representing the valve cylinder. The 'steam entry' connexion is a Handrail Support fixed as shown, and spaced by a Washer. The ends of the valve cylinder are Chimney Adaptors.

THE MAIN CYLINDER

Figs 1, 2, 3, 8, & 9: The main body of this unit is a cylinder fitted with a large Flanged Wheel at each end, each of which is fitted with two Fishplates which secure them to a pair of 1½"Angle Girders forming the brackets for attachment to the plinth.

THE VALVE ROD

Figs 1, 3, & 8: The Single-Throw Eccentric has a 1"Triangular Plate fixed to its arm (Fig 8). Two 2½"Narrow Strips are fixed to the remaining holes in this Plate, and these are both joined by their end holes to an End Bearing which carries a 4½" Rod in its boss. Mounted on this Rod in

THE VALVE ROD

Figs 1, 3, & 8: The Single-Throw Eccentric has a 1"Triangular Plate fixed to its arm (Fig 8). Two 2½"Narrow Strips are fixed to the remaining holes in this Plate, and these are both joined by their end holes to an End Bearing which carries a 4½" Rod in its boss. Mounted on this Rod in the position shown, is a Coupling with a ½"Bolt. The Rod passes through the Chimney Adaptors mentioned above.

THE MAIN CONNECTING ROD

Figs 2, 3, & 8: The Flat Tunnion on the Double Arm Crank that is fitted to the end of the crankshaft is connected by a lock-nutted Pivot Bolt [147b] to an arrangement that is identical to that of the valve rod, except that the Narrow Strips are 3"long, and the Axle Rod is 6½"long. The Triangular Plate is spaced from the Flat Trunnion by a Washer, a Collar, and one of the lock-nuts.

THE GOVERNOR'S BASE

Fig 9: Two 1½"Angle Girders each supporting a Flat Trunnion are fixed to the plinth as shown in Fig 9. The tips of the Flat Trunnions are connected by a 1½"x1½"Double Angle Strip spaced from them by a Washer at each end. The D A Strip carries two Bolts pointing upwards and secured by Nuts as shown. These Bolts will later hold the Boiler End that crowns this assembly. The remaining sides of this structure are a pair of Trunnions fixed to the plinth as shown.

THE 4-SPEED GEARBOX

Figs 7 & 9 *First Shaft*: Within the assembly just described, a 25-tooth Pinion is fixed on a horizontal 6½"Rod which passes out through the centre hole of the Flat Trunnion, on each side of which is placed a Washer. A Collar is fitted on the Rod next to the Washer outside the governor housing.

Referring to Fig 9. the sequence of Gears on the shaft (from left to right) is as follows: 60-tooth, 57-tooth, 50-tooth, 38-tooth [1"Gear], and finally, a ½" Bevel Gear (teeth outwards). The Rod terminates in a journal formed by the Coupling on the crankshaft (see Fig 7).

Second Shaft: this is a 5½"Rod journalled alongside the first shaft in two supports formed by 1"x1"Angle Brackets as shown in Fig 7. The order of parts on this Rod (from right to left in Fig 7) are: support, Washer, 15-tooth Pinion, 19-tooth Pionion, 25-tooth Pinion, 1"Gear, a Socket Coupling supported on the boss of the 1"Gear and a Collar, Washer, support, and finally, a 1"Bush Wheel [Part 518].

A further pair of 1"x1"Angle Bracket supports provide the bearings for the *Third Shaft*, colinear with the second shaft. From right to left (in Fig 7), it carries: another 1"Bush Wheel — bearing a pair of Long Threaded Pins in diametrically opposite holes, whose shafts engage holes in the first 1"Bush Wheel — Washer, support, ¾"Sprocket, support, Cone Pulley (this latter may be replaced with any other suitable Pulley, Gear or Sprocket Wheel).

A 2½"x1"Double Angle Strip forms both bearings for the *Fourth Shaft* — a 4" Rod carrying on its end a Coupling fitted with a 3½"Crank Handle which forms the gear change lever. The second shaft is slid by means of a fork made from two Rods (set in another Coupling fixed to the centre of the fourth shaft) which engages the groove of the Socket Coupling. By the use of this gear lever, an imaginary 'operator' can control the speed of the Power Plant from the walkway by the 'whistle' lever.

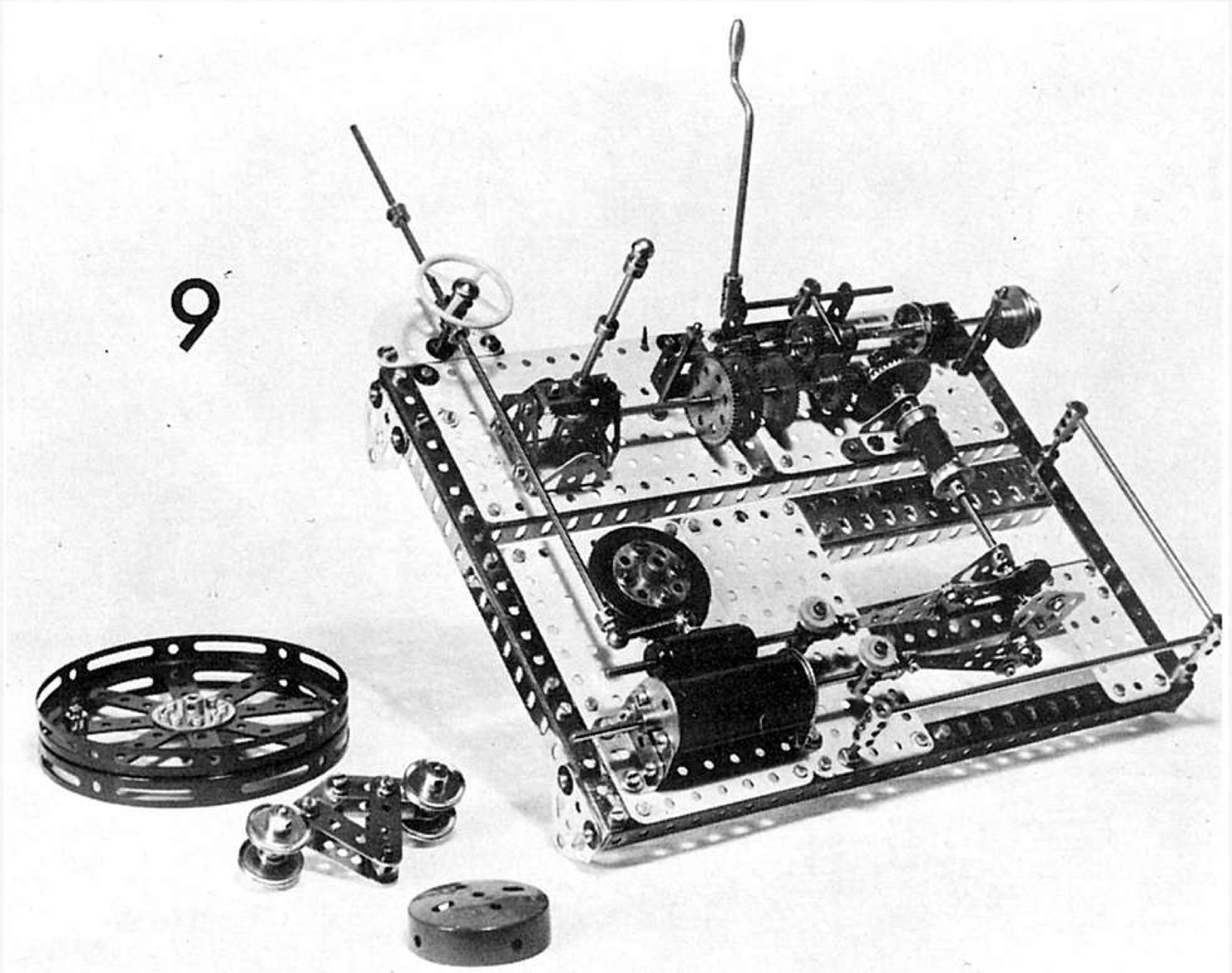
THE GOVERNOR

Figs. 6,7,8, & 9: Referring to Fig.6, two 1½"x½"Double Angle Strips are fixed under the governor's base, and braced with a 1½"Strip. Next, the governor itself is constructed (Fig.8). A Handrail Coupling forms the peak of this unit, in it is fixed a 6½"Rod with a Collar just below the former part. This Collar is fixed to the Rod by Bolts that each hold a pair of 2"Strips (with centre hole) which are free to swing.

Lower down the shaft a Collar is fixed to limit the movement of the governor's arms. Next on the shaft is another Collar which must remain free to slide on the Rod. To this Collar are fixed two pairs of 2"Strips by [No 17246] Shouldered Bolts from a Universal Coupling or Swivel Bearing. The other ends of the Strips are *loosely* bolted to the centre holes of the first 2"Strips by the use of Bolts with pairs of Nuts locked together (Fig.7). Thus, when the lower Collar is moved upwards, the whole governor unit 'expands', and the arms move outwards. When the arms are almost horizontal, the central 'limit' Collar should be set to prevent further upward movement of the lower Collar.

The governor's weights are formed by four 1"Pulleys-with-boss locked to 1½" Rods in the outer holes of the arms. Two Washers space each Pulley from each arm, and two Washers and a Collar on the 1½" Rods fill the space within each arm (Fig.7).

A fixed Collar supports the governor shaft, as it rests on top of the Boiler End that forms the top of the governor's base (Fig.8). Before the latter is fitted in place with a pair of Nuts, a ¾"Contrate Wheel



is fixed onto the governor shaft in mesh with the Pinion inside the governor's base (Fig.9).

Underneath the plinth, a Collar — below the 1½"Strip — terminates the governor shaft and prevents it from moving upwards (Fig.6).

THE GEARBOX COVER

Figs. 1,3, & 7: This item may be omitted if desired, thus giving a better view of the gearbox; alternatively, a 'clear-view' cover may be devised by the builder, using Transparent Plates. The cover shown in the illustrations consists of two 7½"Flat Girders bolted to three 2½" □ Curved Plates as shown, and supported by two 3"Screwed Rods in the positions indicated. If Electrical Terminal Nuts [Part 542] are used instead of standard Nuts at the top of the Rods, the gearbox cover may easily be removed for inspection, oiling, etc.

FLAGPOLE ASSEMBLY

Figs. 1 & 2: Four ½"Bolts secure an 8-hole Bush Wheel and a Wheel Flange to the plinth. The flagpole is an 8"Rod bearing a suitable made-up flag attached to the pole via a Right Angle Rod and Strip Connector held in position by a pair of Collars.

THE HANDRAILS

Fig.1: Two Rod Sockets are fixed to the plinth — near the flywheel — as shown. These Sockets are fitted with 1"Rods to which Couplings are fixed. The Couplings are connected by a 5½"Rod. The Coupling at the corner of the plinth is also fitted with an 8"Rod which is supported at its other end by another Coupling (or Threaded Coupling) fixed to the plinth by a 28.5mm Bolt as shown.

THE 'STEAM PIPE'

Figs 2 & 7: A Semi-Circular Plate is secured to the side of the plinth by a 2½" Angle Girder. A 19mm Bolt passes up through this Plate to support a horizontal Coupling with a short Threaded Pin fitted in the other central tapped bore. Two Washers are placed on the shaft of the Pin, followed by a 1¾"Steering Wheel representing the steam regulator.

A 1½"Rod is now fitted in the 'eye' of the Handrail Support on the side of the valve cylinder. On the other end of this Rod, the 'eye' of a Handrail Coupling is fitted. The boss of this Coupling holds an 11½"Rod which passes through the Coupling of the 'steam regulator'. A Collar and a Washer are next placed on the Rod, as seen in Fig.7. This Collar is fitted against the side of the boiler house after final assembly.

The remainder of the 'steam pipe' Rod disappears inside the boiler house as the plinth is now fitted in position.

FINAL ASSEMBLY

Figs. 1 & 2: The plinth is bolted to the base frame by means of the Flat Trunnions as shown. After the plinth is in place, the Sprocket Wheels on the Motor and gearbox are connected with Chain.

The final touch is provided by the handrail behind the boiler house. This is an 11½"Rod journalled in Collars supported by two 2"Screwed Rods firmly nutted to the base.

All bearings should be lightly oiled before the model is run.

LIST OF PARTS REQUIRED

of		No	of		No	of		No
4	—	1b	1	—	26c	3	—	115
6	—	2	1	—	27	2	—	115a
9	—	3	1	—	27a	2	—	109
2	—	4	1	—	27d	2	—	118
8	—	5	1	—	29	1	—	123
8	—	6	1	—	30a	4	—	126
1	—	6a	1	—	30c	7	—	126a
4	—	7a	2	—	31	1	—	130a
10	—	8	394	—	37b	3	—	136
2	—	8a	469	—	37c	2	—	136a
4	—	8b	85	—	38	1	—	137
5	—	9	2	—	38d	1	—	154a
5	—	9a	1	—	46	1	—	154b
6	—	9b	3	—	48	8	—	154c
5	—	9d	2	—	48a	2	—	147b
4	—	9f	2	—	52a	3	—	155
25	—	10	27	—	59	2	—	163
7	—	11	1	—	62a	3	—	164
25	—	12	1	—	62b	2	—	166
4	—	12a	10	—	63	1	—	171
2	—	12b	1	—	63b	1	—	173a
2	—	13	2	—	63d	2	—	179
3	—	13a	2	—	70	1	—	185
4	—	14	1	—	73	2	—	187
2	—	14a	2	—	77	1	—	189
1	—	15a	1	—	79	2	—	193d
1	—	15b	2	—	80c	4	—	194c
4	—	16	2	—	81	4	—	194d
1	—	16b	1	—	82	2	—	194e
6	—	18a	4	—	89a	2	—	195
2	—	18b	4	—	90a	2	—	197
1	—	19s	1	—	96	3	—	200
3	—	20	1	—	96a	1	—	212
4	—	20b	2	—	103b	1	—	212a
8	—	22	1	—	103c	3	—	214
4	—	22a	1	—	103f	4	—	215
2	—	23	2	—	103h	1	—	216
2	—	23a	4	—	103k	3	—	235
2	23b or 23		13	—	111	2	—	235a
3	—	24	10	—	111a	2	—	235b
1	—	24c	8	—	111c	1	—	235d
2	—	25	5	—	111d	2	—	518
1	—	26	2	—	114			

1xNo1 C/W Motor. 2x17246 U.Coupling Bolts.

All photographs courtesy British Airways

KEN WAGNER,
assistant to Concorde
Engineering Project Manager,
reviews

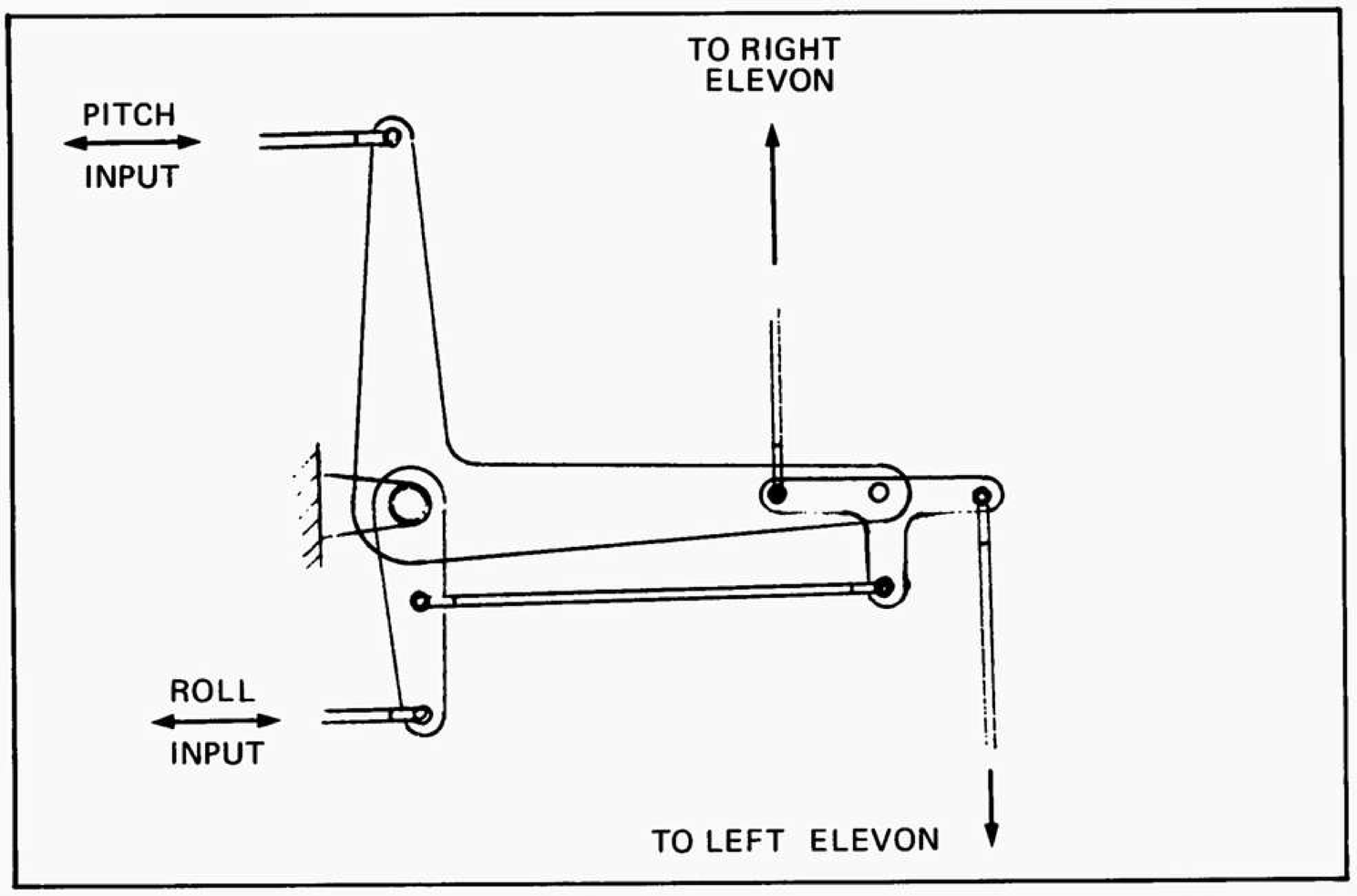
CONCORDE IN SERVICE

Concorde has been a familiar sight at London and Paris for over a year. Cruising at over twice the speed of sound, it has drastically cut flight times to Bahrain, Washington, and Rio de Janerio. How does *Concorde* differ from other aircraft?

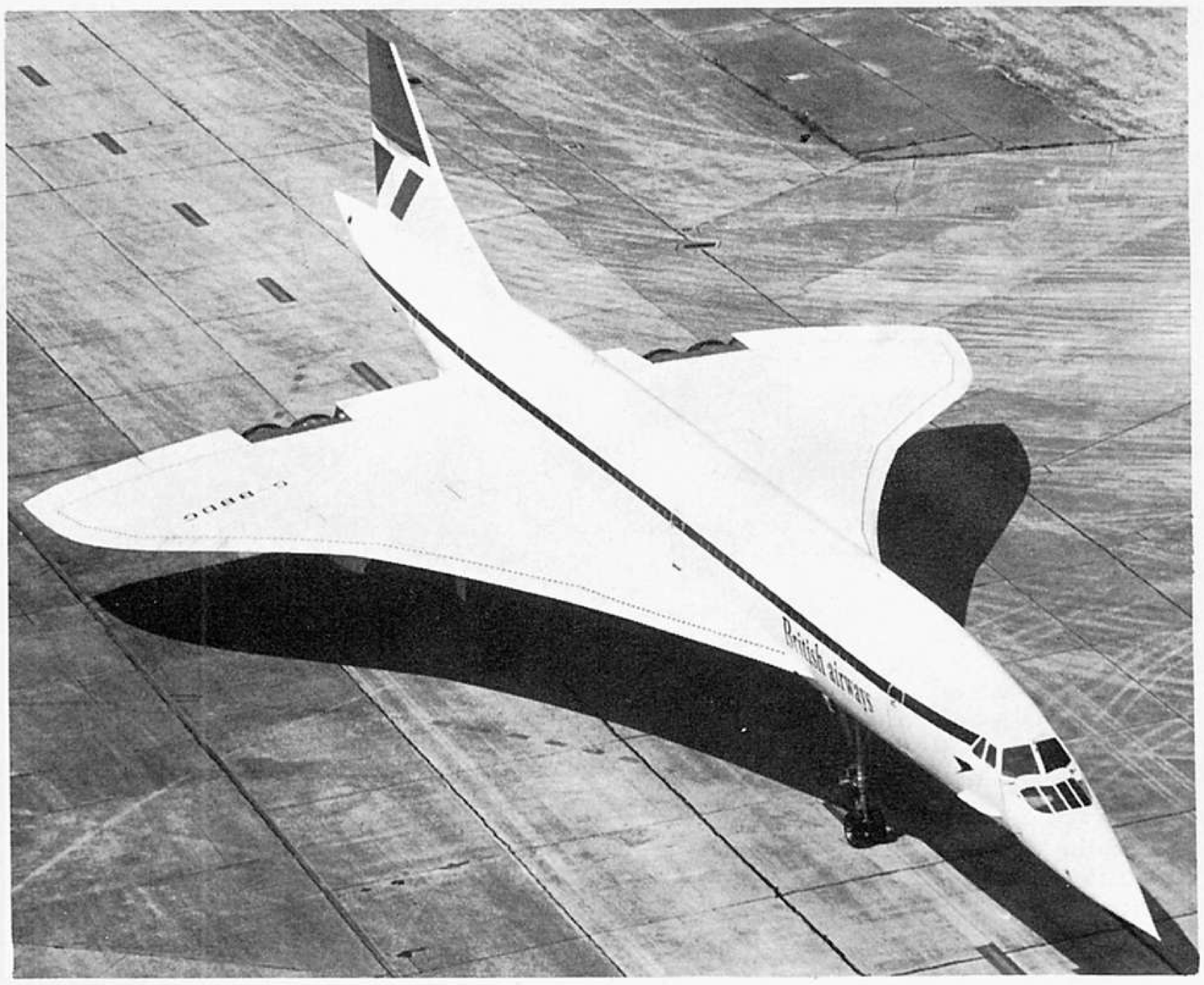
The external shape is the most noticeable difference. For supersonic flight, the aircraft must be very slender and very streamlined, hence the sharp nose and narrow fuselage. The wing and fin are also very thin.

The optimum wing shape was developed during many years of careful wind-tunnel work, backed up by flight trials on experimental aircraft. The basic delta shape has been in use for many years, but on *Concorde*, the shape has been modified to improve slow-speed handling. The inboard wing has been extended forward, the tips have been rounded off, and the leading edge has been contoured to produce extra lift during take-off and landing. Flaps, leading-edge slats, and air brakes are unnecessary.

There is no tailplane, so the control surfaces on the trailing edge of the wing act both as ailerons and elevators, and are called 'elevons'. The rudder and elevons are hydraulically driven and electrically signalled. There are three hydraulic supplies, and two separate electrical signalling channels plus a standby mechanical signalling system. The pitch and roll inputs from the pilots' controls are combined to create the correct elevon deflection signal. In the electrical signalling channels, the inputs are mixed by resolvers, but in the mechanical channel, the inputs are mixed by a system of levers.



ELEVON PITCH & ROLL SIGNAL MECHANICAL MIXING

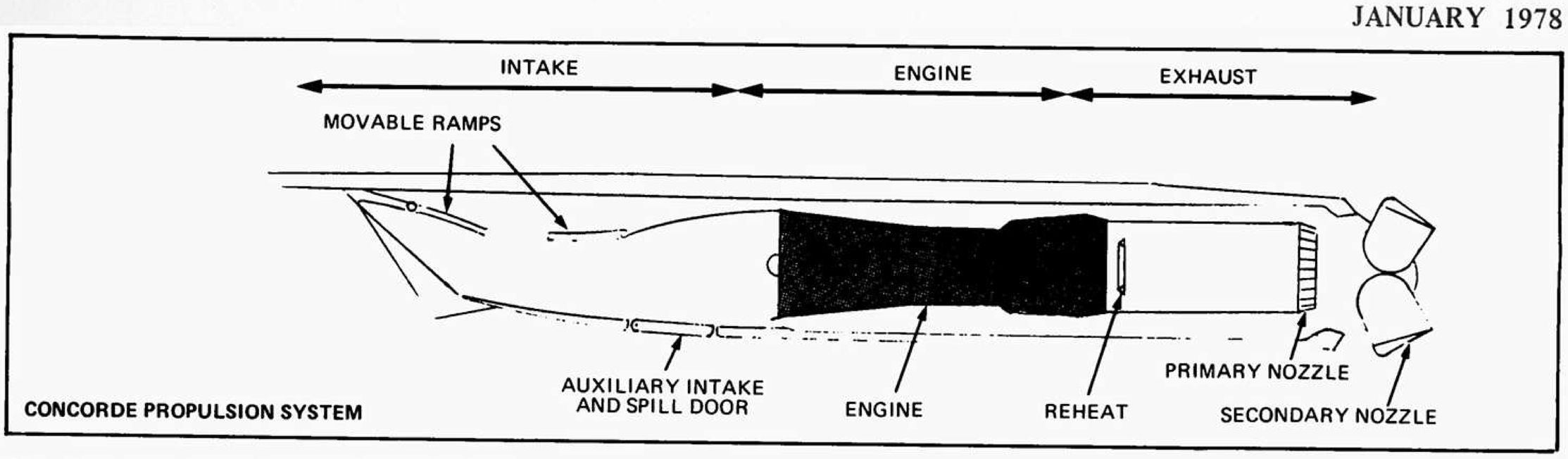


Because of the high nose-up attitude during take-off, and particularly during landing, the flight crew would be unable to see the runway, so to improve visibility, the nose is drooped. For supersonic flight, the nose must be fully up, and to reduce drag further, a visor is extended over the flight deck windows to smooth the airflow.

The propulsion system consists of intakes, engines, and exhaust, and on *Concorde*, these are far more complex than on any previous civil aircraft. The engine itself is very conventional, except in that it is controlled entirely by electrical amplifiers, rather than the hydro-mechanical systems used on earlier engines. The velocity of the air entering a jet engine must be subsonic, otherwise the compressor would not work effectively. The air entering the intakes must therefore be slowed from supersonic to subsonic before reaching the engine. This is achieved on *Concorde* by variable-geometry intakes containing movable ramps. At take-off, the intakes are fully open, but at supersonic speeds the ramps move down. Not only do they slow the air, but they also increase the air pressure, and this contributes to a more efficient propulsion system. These ramps are hydraulically driven, but electronically controlled.

The exhaust system contains two nozzles and a 'reheat'. To increase engine thrust for take-off and transonic acceleration, extra fuel is burned in the exhaust. This is reheat, and it produces a lot of noise, consumes a lot of fuel, but provides a lot of extra thrust. To obtain

Left: Concorde's shape is clearly seen in this unusual view

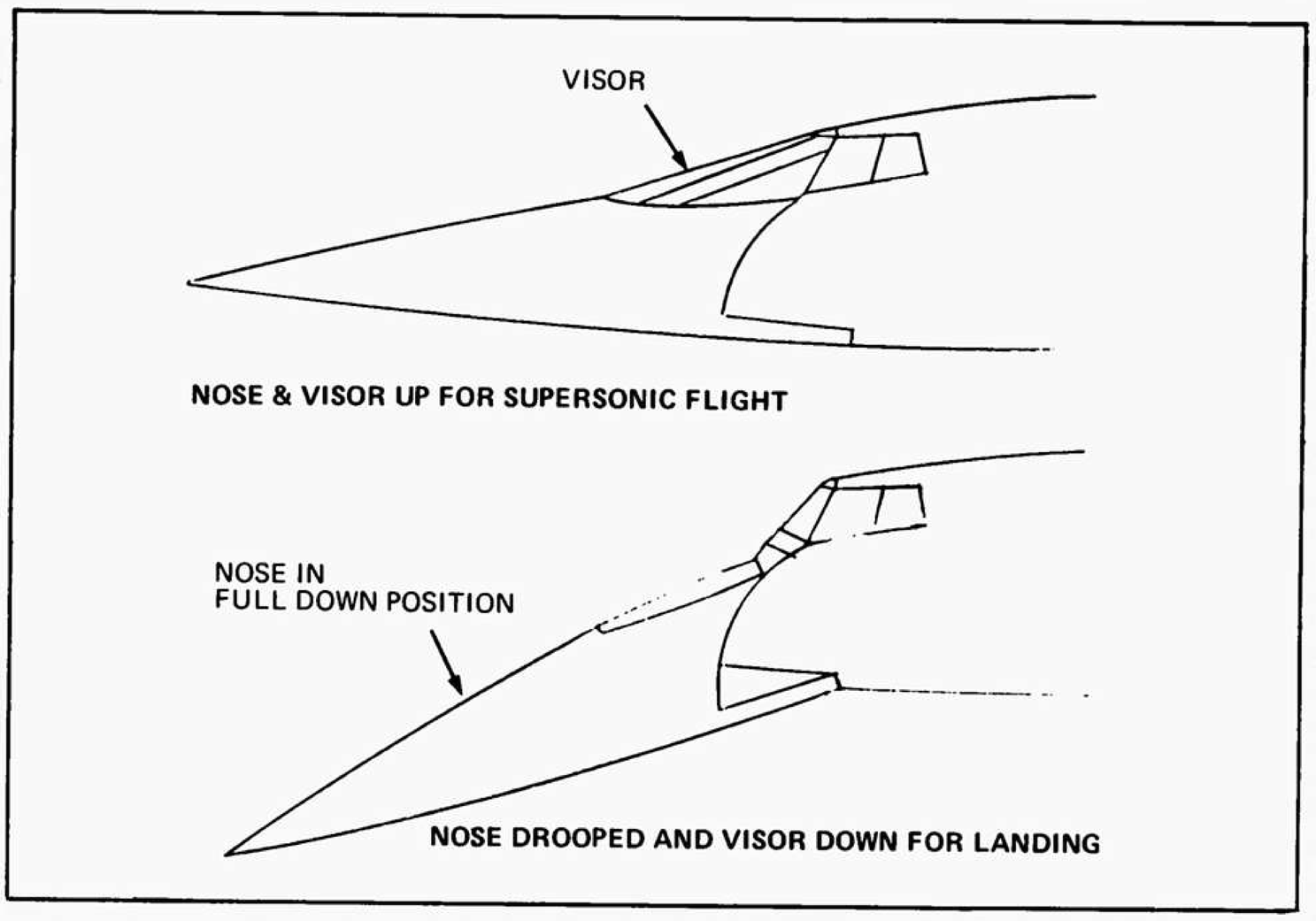


CONCORDE PROPULSION SYSTEM

the highest efficiency from any engine, the area of the exhaust nozzle should be changed to suit the flight conditions. On subsonic aircraft, a fixed-area nozzle will normally suffice, although for part of the flight it will be inefficient. On *Concorde*, there are two nozzles on each exhaust. The first (primary) nozzle controls the speed of part of the engine compressor, whereas the second (secondary) nozzle effects the thrust of the engine. The secondary nozzle consists of two 'buckets', and during landing, these can be brought together to produce reverse thrust to stop the aircraft. Both nozzles are air-driven but electrically signalled.

The cross-sectional shape of the fuselage is so small — to reduce aerodynamic drag — that there is very little room under the cabin floor for baggage and electrical equipment. Consequently, most of the equipment is mounted in racks between the flight deck and the passenger cabin. More equipment and some of the baggage is stowed behind the rear galley. All the equipment is kept cool by large fans which draw air from the cabin across the equipment.

Aircraft flying supersonically become very hot because of kinetic heating caused by friction with and impact of the air on the structure. The aluminium-alloy structure can accept the temperature produced, but passengers and equipment cannot. The air-conditioning system has to produce a lot of cold air, and the fuel is used to help cool this air. Even though *Concorde* flies at altitudes of up to 18 300m [60 000ft], the air-conditioning system maintains the temperature and pressure in the cabin at a comfortable level, and cools all the equipment.



CONCORDE NOSE DROOP AND VISOR

One of the most significant operational differences on *Concorde*, is the need and ability to move the centre of gravity. As the aircraft accelerates through the speed of sound, it is necessary to move the centre of gravity rearwards. This is achieved by transferring fuel out of the forward tanks into the main and rear tanks. As the aircraft decelerates, the fuel is pumped back forward.

Concorde flies fast and well. It is the result of many years of research and development. There will be other supersonic airliners, but *Concorde* will always hold the place of honour as the first supersonic aircraft regularly to carry fare-paying passengers at supersonic speeds in normal airliner comfort.

AMONG THE MODEL-BUILDERS

with 'Spanner'

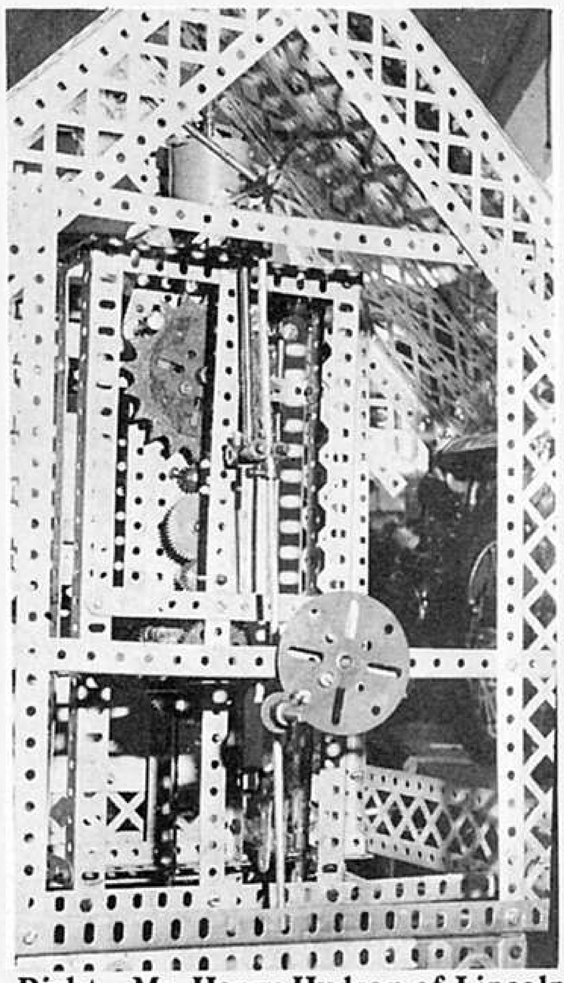
ADJUSTABLE DIGGER ARM

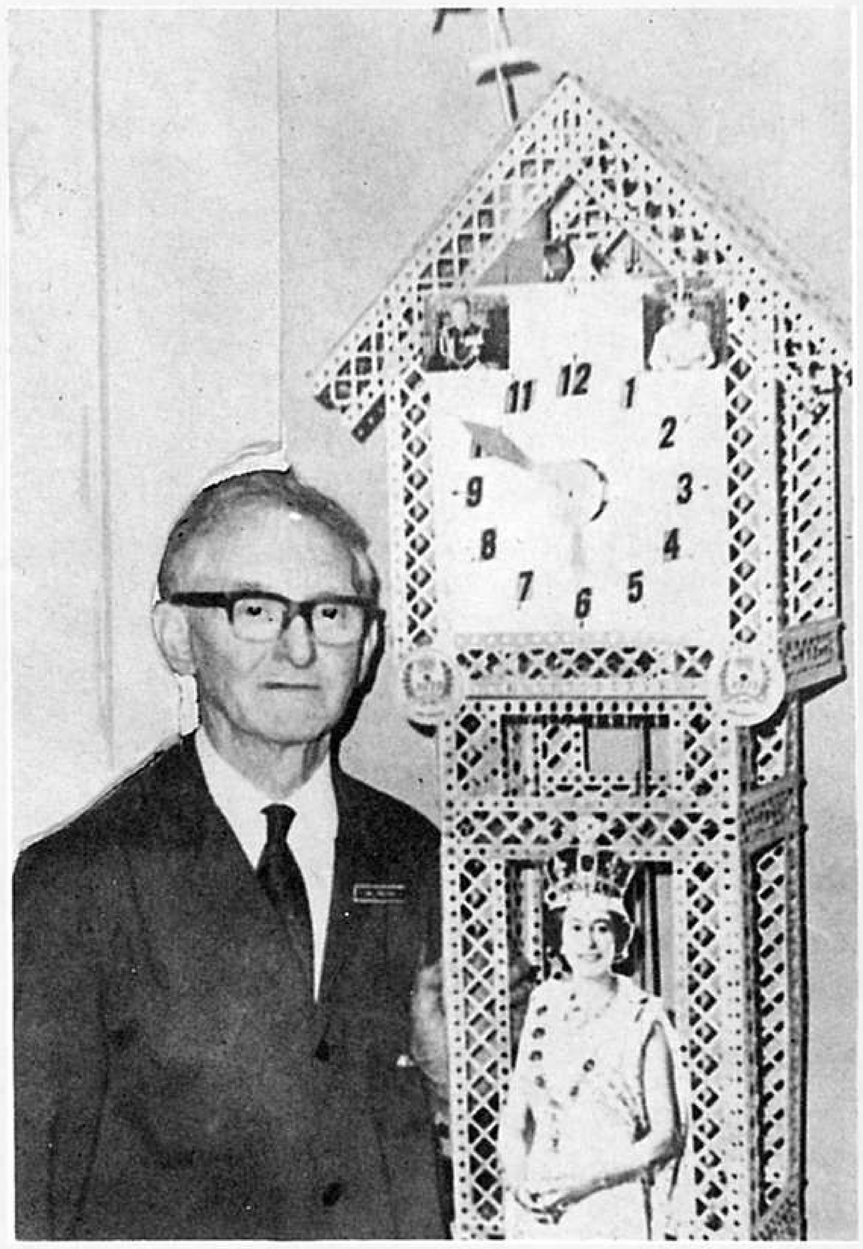
Mr. D. Penney of New Whittington, Chesterfield, recently supplied details of an Adjustable Digger Arm (see enclosed diagrams), accompanied by a very short note asking simply "Is this the material that the magazine is looking for?" I am now delighted to reply to this in the most positive way – by using the material! (I think this indicates that the answer to Mr. Penney's question is "Yes"!)

"The centre pillar for the adjustable arm", writes Mr. Penney, "is made from four 12½" Angle Girders bolted together to form a square section. Two 1½" x 1½" Flat Plates 74 are fastened around the Girders by three 1" Screwed Rods held by Nuts, the Nuts being adjusted so that the Plates slide up and down the Angle Girders. Two Cranks 62 are fastened to the Plates by the top Screwed Rod (fig A) and an Axle Rod 16b is passed through the Cranks to form a pivot for the arm.

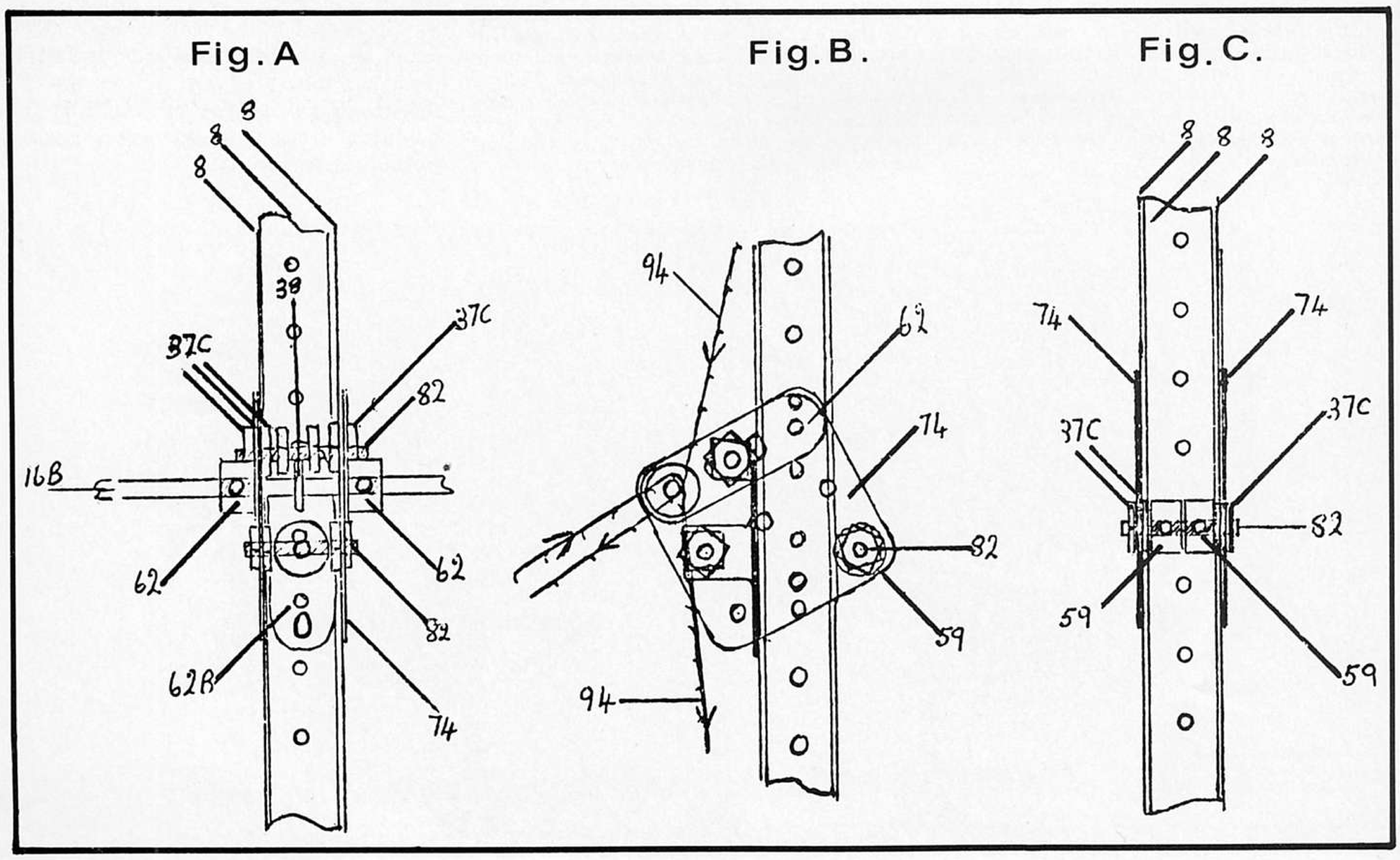
Screwed onto the lower Screwed Rod in fig A is a Double Arm Crank which is held in place between Plates 74 by four Nuts. The upper end of the Double Arm Crank is trapped against one Angle Girder 6 by two Nuts on upper Screwed Rod 82 in fig A.

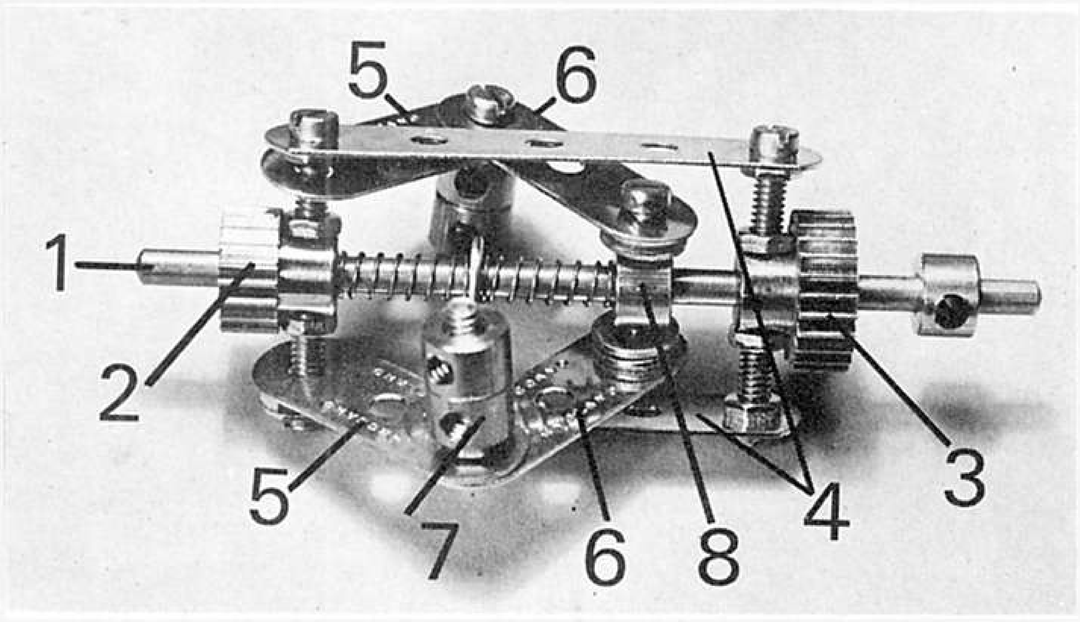
It will be seen from figs B and C that the Screwed Rod carries two Collars 59 which are free on the Rod and which run up and down on Girder 6 as a support roller for the front of the arm. The movement of the arm is operated





Right - Mr. Henry Hudson of Lincoln pictured with the "Silver Jubilee" Grandfather Clock which he built last year. Above, a rear view of the Clock showing the cycle sprocket escapement wheel. Below, sketches showing the Adjustable Digger Arm described on this page.





Pictured left is a simple, yet functional Two-speed Automatic Gearbox designed by 14 year old Jonathan Wynn of Caerleon, Newport, Gwent. Note that Pinions 2 and 3 are loose on their support Rod, while Collar 8 is fixed on the Rod. Note also that the 1½" strips in the centrifuge assembly should pivot freely.

by Sprocket Chain 94 which is passed under andover Rod 16b and is kept apart by a Washer 38. The Chain is then anchored at the top and bottom of the arm, and so forms a loop round one of two ¾" Sprockets fastened into a Socket Coupling (not shown). This Socket Coupling would be mounted, free to turn, on an Axle Rod forming the bearing for the lower end of a suitable jib. Chain drive from the parent model's gearbox would be taken to the second Sprocket Wheel in the Socket Coupling."

PARTS REQUIRED

4 – 8	1 – 38	2 – 62	2 – 74
1 – 16b	2 – 59	1 – 62b	3 – 82
14 – 37c			1 – 94

FIFTY-FOUR AND GOING STRONG!

Make no mistake, this title does not refer to Mr. Henry Hudson's age (he is in fact a young sixty-four!) It refers to the neat and efficient Grandfather Clock featured in the accompanying illustrations. The Clock was built by Mr. Hudson last year in honour of the Queen's Jubilee, yet the particularly interesting thing about it is that, although built for the Jubilee, it is made from parts that are as old as the Queen herself!

In fact, Henry bought his vintage Meccano Set in 1923 and, since that date, he has made scores of different working models. The Jubilee last year gave him an incentive to make the Clock and, having made it, he presented it to his employers, a well-known cycle retailer in Lincoln City. The Company decided to put the Clock on display in the High Street and, as a result, Henry Hudson and his Clock have appeared on television, radio and in numerous newspapers, both local and national.

A modest man, Henry does not have much to say about the success he has achieved in modelling. However, he did explain to Ray Drury, a Lincolnshire journalist, how the Clock was made up. A 14 lb weight drives the Clock for 18½ hours. The pendulum is 5 feet 6 inches long and the only non-Meccano part used is the escapement wheel which is a 20-teeth cycle sprocket and this is understandable as Henry is the Manager of the Cycle Department of his employers' shop! Overall height of the Clock is 6 feet 4 inches.

I am indebted to Ray Drury for providing me with the above information and accompanying photographs.

AUTOMATIC GEARBOX

For our next offering I am indebted to Jonathan Wynn of Newport, Gwent. Jonathan is the designer of the Compact Two-Speed Automatic Gearbox featured here and he is to be congratulated on an efficient little unit.

Carried in a suitable mounting, dependent upon the parent model, the unit consists of a centrifugally-operated sliding shaft 1 carrying a ½" Pinion 2 and a ¾" Pinion 3, spaced as shown but connected together by 2½" Strips and carried on ½" Bolts fixed in the bosses of the Pinions. Mounted loose on the Bolts fixed in the boss of Pinion 2 are two 1½" Strips 5 which are pivotally connected to two more 1½" Strips 6, using ¾" Bolts on each of which two Collars 7 are secured to serve as centrifuge weights. The ends of Strips 6 are pivotally attached to a Collar 8, being spaced from the Collar by two Washers on the shank of each securing Bolt. Two Compression Springs mounted on the shaft return the Gearbox to the lower ratio when the speed falls below the critical point. In operation, of course, Pinions 2 and 3 would engage with appropriate Gear Wheels mounted in appropriate positions.

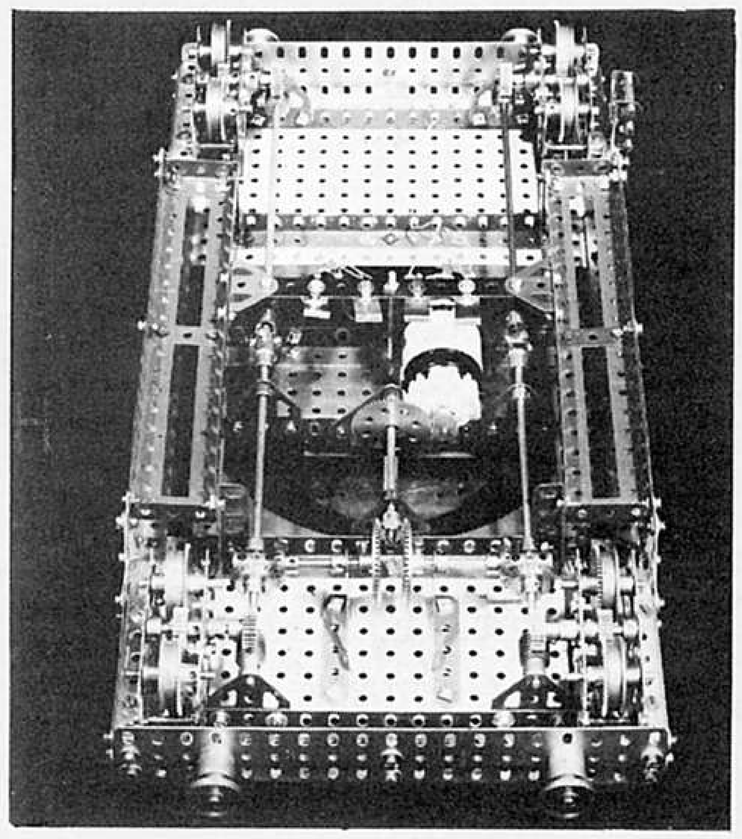
PARTS REQUIRED

2 – 5	1 – 25	2 – 37b	2 – 111
6 – 6a	1 – 26	6 – 38	4 – 111a
1 – 15b	10 – 37a	6 – 59	2 – 120b

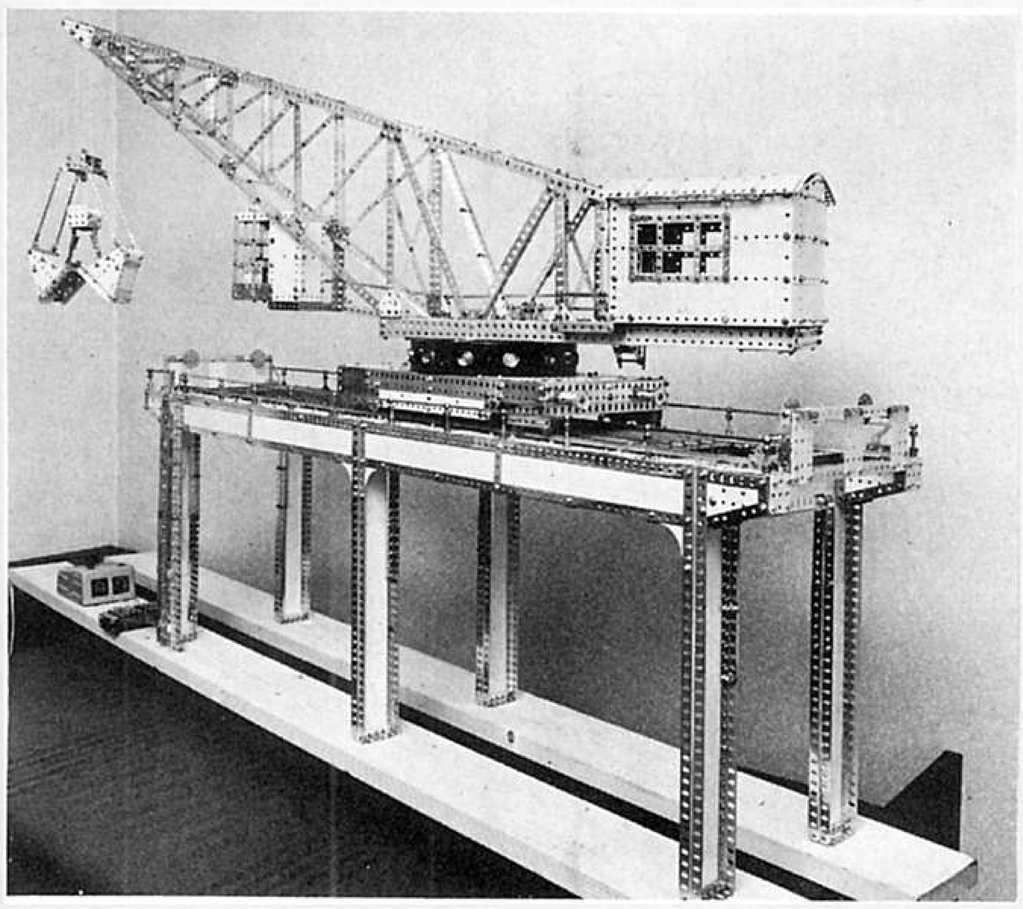
GRABBING CRANE

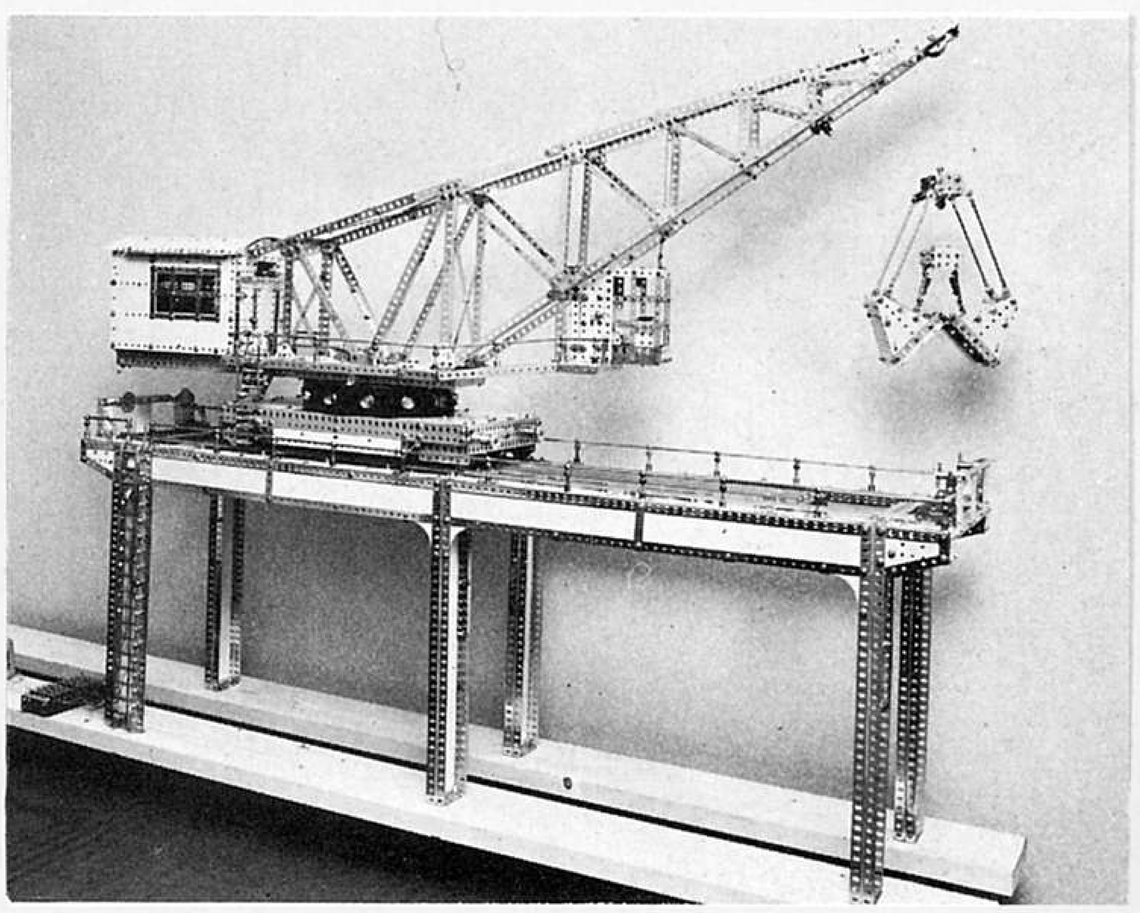
Finally this month I draw your attention to the outstanding Grabbing Crane illustrated here. It was designed and built by long-time enthusiast Hans Hoch of Winterthur, Switzerland, and I think you will agree that, on its high-level platform, it makes a magnificent display piece.

Unfortunately, I am not able to give much information on the model as Hans has supplied only a few very general details, but it is based on a real life original which is described as a Greiferdrehkran 15t x 17.50m. The model performs all the movements of the original – hoisting, grab-opening, slewing and travelling – with each movement powered by its own motor: the Meccano Power Drive Unit. As can be seen, it is built mainly from Meccano parts, although Hans does admit that he used one or two competitors' parts in the base frame roller bearing. Still, nobody's perfect!



Below - two views of an excellent display piece in the shape of a large Grabbing Crane designed and built by Mr. Hans Hock of Winterthur, Switzerland. Above, an underside view of the travelling crane platform





NORTH WEST FRONTIER

by Michael J. Walker

There's no doubt in anybody's mind that Meccano is a hobby that offers extremely wide scope in choice of subject matter. In addition to the usual engineering and mechanical side of Meccano modelling, it's perfectly possible to make models of architectural interest, playthings for the children, functional items for the home, even props for TV and stage productions. The wide range of highly versatile parts make possible the construction of models to a high degree of scale accuracy, packed with authentic features. Whether you regard Meccano as a toy or a full-blown hobby, you need never be at a loss for something different to make!

How strange it must seem then that some Meccano enthusiasts choose not to avail themselves of the full capabilities of the system, with its ability to construct utterly different models with the same parts, but, instead, preferring to restrict their activities to one particular type or style of model.

Whether the subject be clocks, Fairground machines, Meccanographs, buses or cars, somebody somewhere builds and re-builds them time and again, almost all the time! These are the Meccano specialists, well known by other Meccanomen as experts in their chosen field.

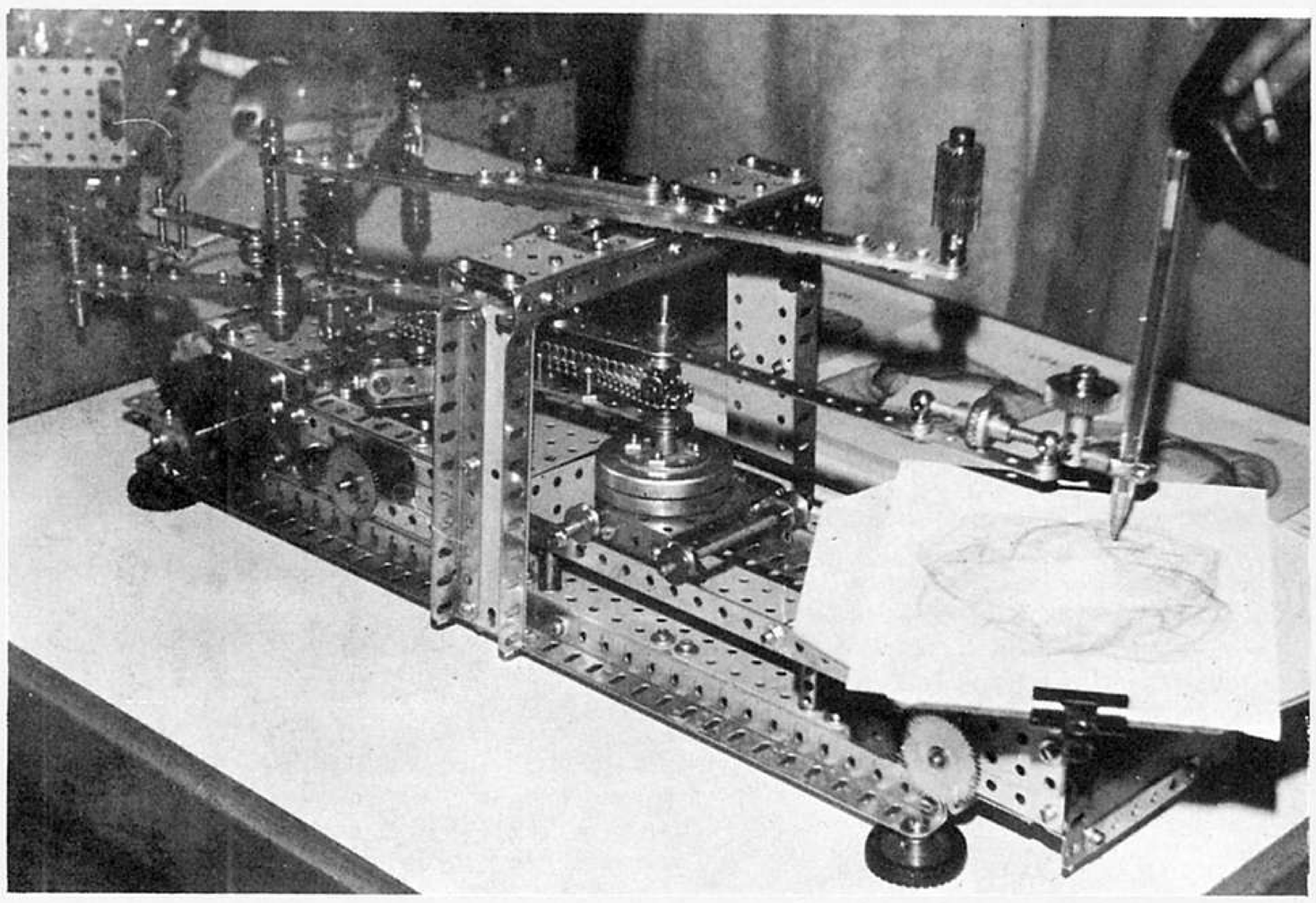
As Secretary of the North West Meccano Guild, one of my duties involves writing the model report after each meeting or exhibition, in which I comment regularly on the ever increasing technical excellence of models on show. Like every Meccano Club, we in the NWMG have our share of specialist constructors, and they, too, never fail to improve on their best efforts from one meeting to the next. This then, is probably the main reason for the specialist's apparently dogged perseverence; the search for perfection, the dream that one day he will produce a Meccano model, of any particular subject, that cannot be bettered!

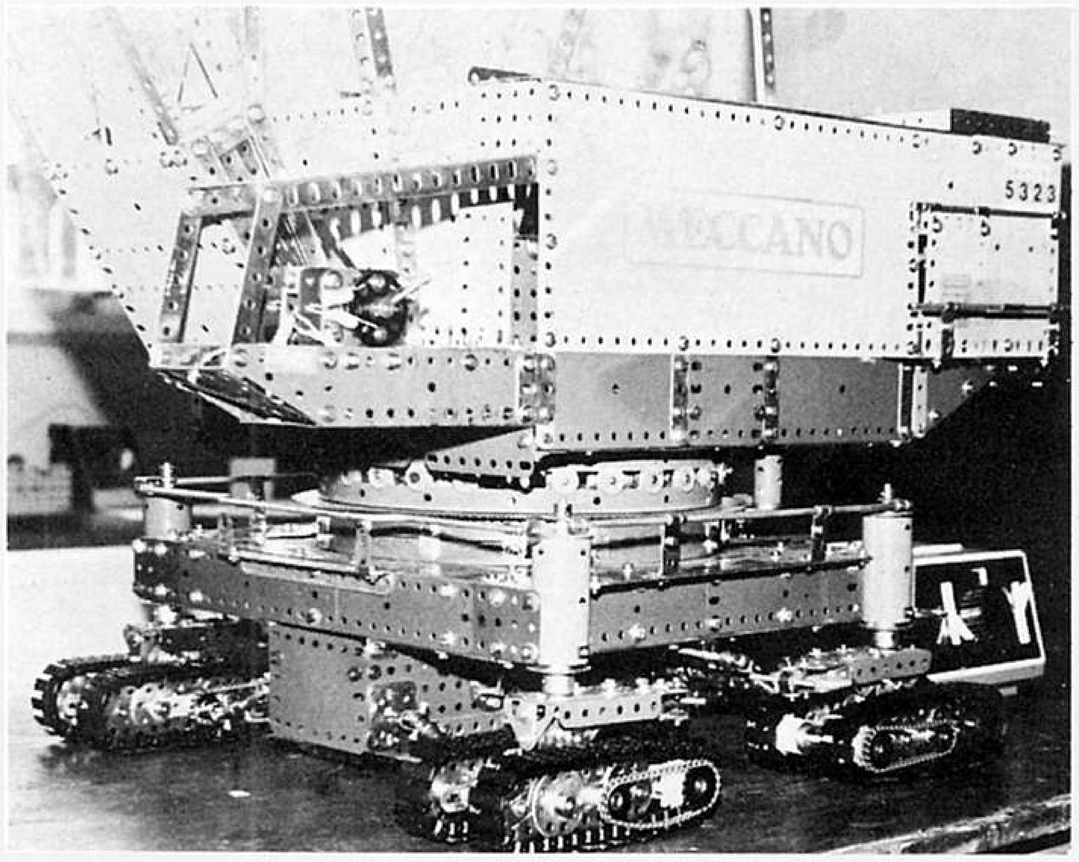
Is this possible – to build a Meccano model that cannot be improved in any way? Maybe not, but if anyone at all is to approach this happy state of affairs it must surely be one of the Meccano specialists, who have the advantage of vast experience within their chosen field.

Thus it is, then, that in my opinion they have a definite role to play in the life of the Meccano hobby. Far from expecting a change of model from the specialists in the NWMG, I welcome their latest versions for the very many technical advances made, some for the first time ever in Meccano modelling. In this respect, they can be likened to pioneers, pushing forward ever further the frontiers of their adopted "territory".

Modellers who concentrate on one subject, (e.g. trams, excavators, etc) form the main body of Meccano specialists, but there are also those who specialise in size, no matter what the subject. These include the people who always build extra large models suitable for exhibitions. Yet another category includes the modeller who take the products of a particular firm or company as prototypes. An example of the latter is Graham Brown, shown here with his "Centaur" dump truck manufactured by the special products division of British Leyland. Other top-class models by Graham include the Aveling-Barford Super 7000 Motor Grader and an Atlantean Bus, again Leyland products.

Ultimately, everyone benefits from such specialisation, as, in return for a polite request, one can examine the best efforts of any expert modeller in the subject of your interest, thus helping to improve your own model when the time comes to construct it. In this way, the Meccano Hobby progresses; ever moving forward in the better and better models built by those most important people: the constructors!





Above, one of the latest in Hal Hussey's long line of Meccanographs. This version features variable table speeds and multi-colour adaptability. Below left- a view of the base and turntable section of Mike Pashley's huge Marion Excavator. Below right -Graham Brown, who specialises in building British Leyland Special Products Division vehicles, pictured with his "Centaur" Dump Truck. Modellers who specialise are important to the Meccano hobby as a whole.

rototypes

Contributed by:
BERNARD DUNKLEY

This is a series to give ideas to active and creative modellers. In these days, more than ever before, there are many amazing engineering innovations, and sometimes these are not given a great deal of publicity. We aim to rectify this situation by bringing you pictures and information on these topics that will set your mind working on new models with a difference. In this first article, we deal with a very popular Meccano model subject — cranes

THE MORRIS CONTAINER-HANDLING CRANE

Gantry cranes have developed a lot in recent years, and the introduction of containers for freight transport has led to the appearance of a whole new breed of cranes with very clean 'modern' lines.

Our first picture shows the Morris answer to container-handling problems. Note the cab position that allows the operator to keep a close watch on his load.

The lift is effected by a rigid box-construction 'mast' that is raised and lowered by some obviously substantial machinery in the big box on the crab trolley.

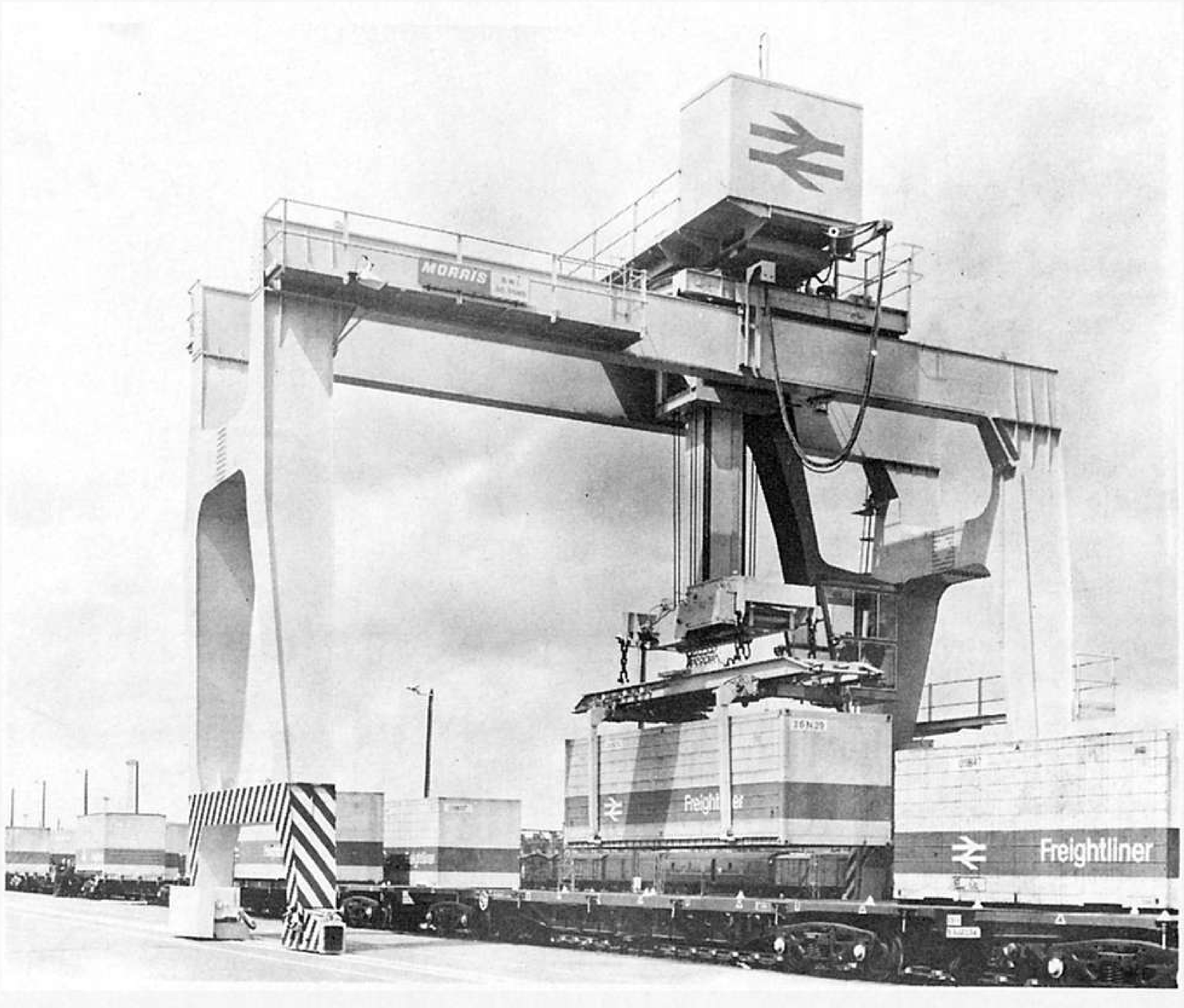
Notice the turntable under the box. This allows the mast to slew to allow for wrongly-placed loads. Tilting of the mast is also possible for the same purpose. The loop of cables visible under the box carries electrical power to the 'works'.

The lifting gear on the crane illustrated grasps a lip at the bottom of the container, and the use of chains between the lifting gear and the foot of the mast is interesting.

Note that the travelling bogies completely hide the wheels, which must be quite small. One bogie carries motive power units (electric motors) and is therefore more bulky than the others.

The Herbert Morris catalogue of container-handling cranes shows quite a variety of arrangements. The model shown is an '0—4—0' type, since it spans four railway tracks and lifts only within the span. Some of these cranes have overhangs at the ends, and the crab can take the lifting mast and cab beyond the legs of the crane to cater for two more railway tracks. The biggest one in the catalogue [at the time of writing] covers 10 tracks in a '2—6—2' arrangement. Since the box-girder cross ties have to be quite low down for the overhanging type of crane, to allow the cab and lifting gear to pass through, some pretty hefty metalwork is called for to retain the rigidity.

The British Rail 'livery' for the crane illustrated is yellow for the main surfaces, and red for the cab and its supporting arm. The safety stripes are black. For an idea of the scale, the containers are 12m long, and the span (centre to centre of the track rails) is 16m. The hoist speed is 6m/min with a full 30-tonne load, and the slewing speed is an incredibly slow 0.25rpm.

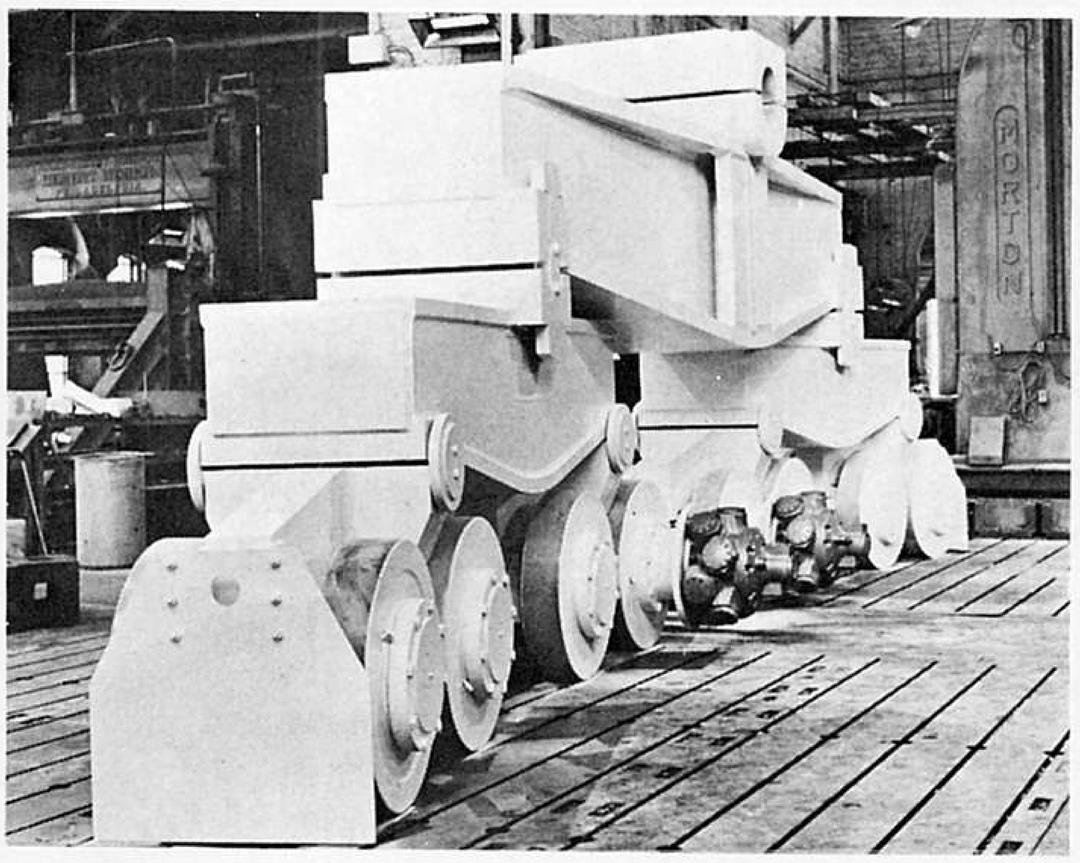


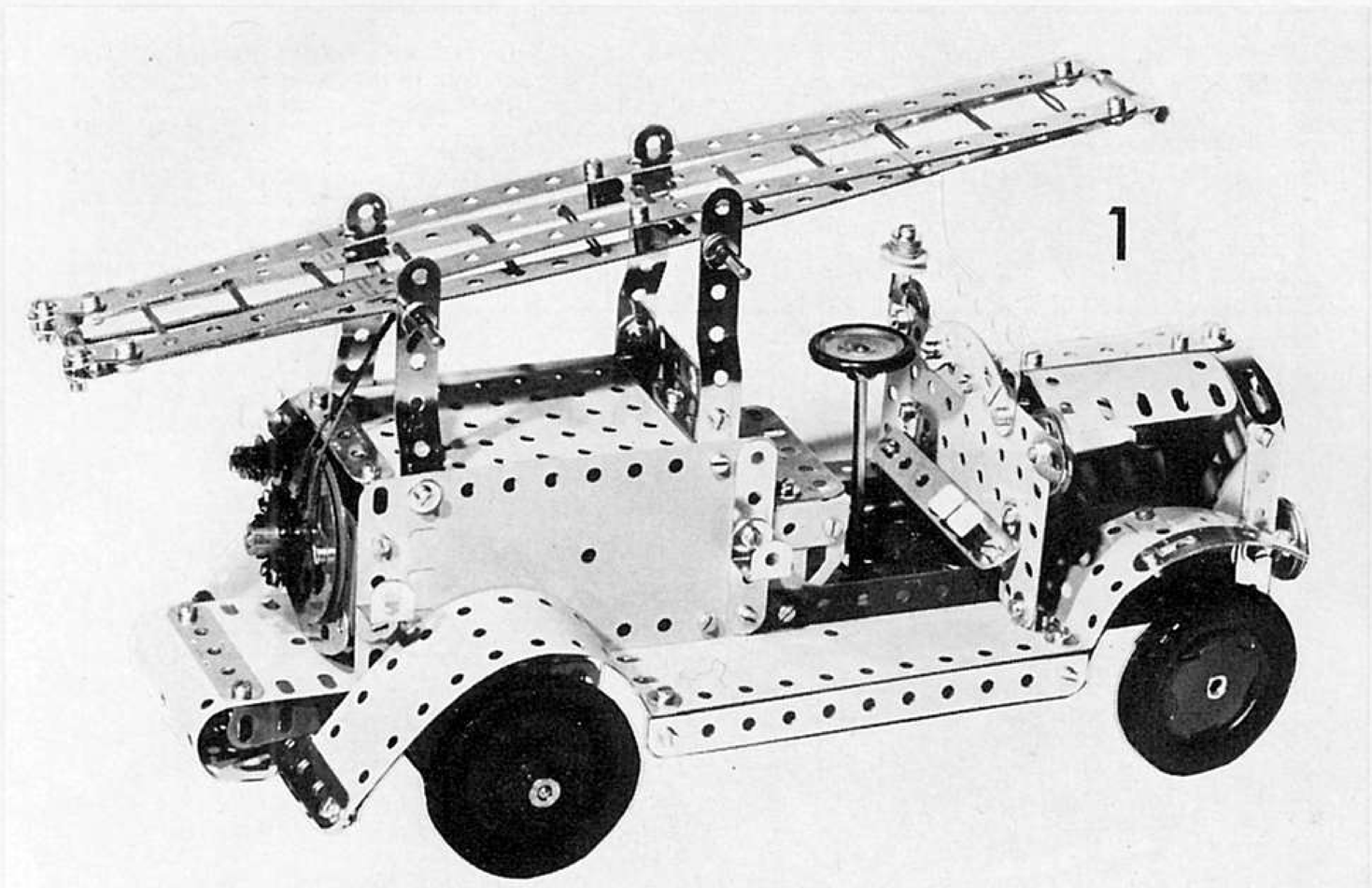
GIANT SLEWING DERRICK CRANE

How about building a model of the world's largest derrick crane? It can lift 1 000 tonne, and it was designed for raising and positioning giant nuclear reactor pressure vessels at the Chicago Bridge & Iron Company's plant at Memphis, USA. The pressure vessels were tested there and then shipped to the Philadelphia Electric Company's Peach Bottom atomic power station.

The first picture below shows the crane dwarfing everything that surrounds it. In the second picture, we have a closer look at one of the three massive bogies. The knobbly things on the innermost wheels are 10-cylinder hydraulic motors, of which four are used on each bogie.

All the girderwork on this massive crane is of circular cross-section — which is a challenge for Meccano modellers, but one that will no doubt be met. Incidentally, the Editor has asked me to mention that he would be interested in publishing pictures of models based on prototypes shown in this series.



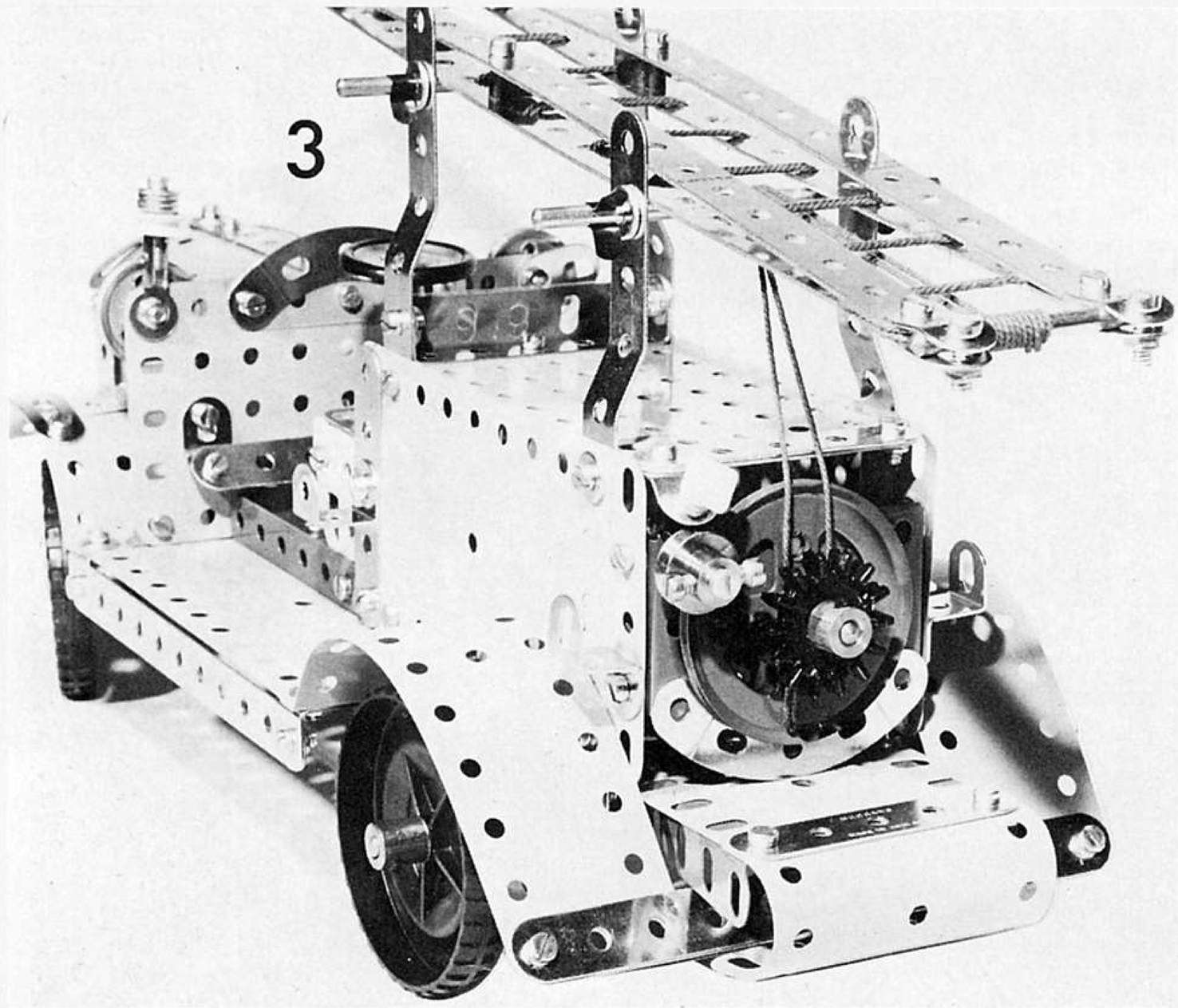


General view of the veteran Dennis Fire Engine showing detachable cantilever ladder

B. N. LOVE shows that realism and 'atmosphere' can be captured even in less-complex models with this No. 5 Set . . .

Veteran Fire Engine

Rear view of Fire Engine showing pumping platform detail and cord lacing detail of the ladder



Getting the most out of any Meccano Set, regardless of its size is a challenge which all enthusiasts should be prepared to accept. Age should not be a limitation on the size of set being used; many fine examples of smaller but appealing models have come forward from advanced constructors.

Fire engines have been one of the author's prime interests since boyhood, and the model illustrated here was inspired by a very expensive Japanese plastic kit of parts for the 1916 Dennis Motor Fire Engine.

Despite the limited parts in the No 5 Meccano set, a good overall likeness of the old Dennis Fire Engine has been achieved together with the following details. A removable cantilever ladder with a full set of rungs, positive steering through quite a wide angle, rear turbo fire pump with hydrant coupling unit and control valve, foot pedals in clutch and brake positions, fire bell, head and side lamps, wing mirror, and an engine block complete with cooling fan and exhaust pipe.

CHASSIS

Figs 1 and 2 show most of the details just mentioned. The first step in the construction is to make up the chassis from the two Sector Plates and the large Flanged Plate. Bolt the rear Sector Plate under the back row of holes in the Flanged Plate but sandwich a 2½" Double Angle Strip between the Plates with its lugs pointing downwards.

Now add two more 2½" D A Strips which, in turn, sandwich two 5½"x2½" Flexible Plates against the underside of the 5½"x2½"Flanged Plate (See Fig 4).

At this stage, only one Nut & Bolt should be used to hold each D A Strip, as the outer Bolts will be inserted when the mudguards are attached.

At the front, set the second Sector Plate three holes under the Flanged Plate where it will also trap the 5½"x2½"Flexible Plates, and the general form should appear as shown in Fig 4. Note that the Flexible Plates protrude by one row of holes forward of the end of the Flanged Plate, and this is clearly seen in Fig 7.

Continue the construction by bolting a 'U'-shaped 2½"x2½"Plate together with a 2½"Strip and a 2½"□Flexible Plate to the pump platform at the rear as shown in Fig 3. The inner end of the 2½" □Plate is bolted to the Sector Plate by a 2½"D A Strip, this time with the lugs pointing upwards.

Attach a pair of vertical 5½"Strips to these lugs, allowing one hole clear below, and then bolt on Semi-circular Plates to the lower end of the Strips to act as rear axle journals. The forward ends of the Semi-Circular Plates go to the D A Strip already in position (see Fig 4).

TANK

Sides for the emergency water tank forming the main part of the Fire Engine body are made from 4½"x2½"Flexible Plates, but each one is extended to the rear by lapping a 2½"x1½"Flexible Plate two holes in, and bolting through on the vertical 5½"Strips. A second pair of 5½" Strips support the side plates seven holes along, and these Strips touch the bottom of the Flanged Plate. All four Strips make the ladder supports and, as the forward pair stand one hole higher than the rear, a suitable slope for the ladder in its stowed position is thus achieved. No attempt should be made to bend the 5½"Strips at this stage.

A top for the water tank is supplied by a 4½"x2½"Flat Plate bolted to one 2½" D A Strip which is attached to the front ladder supports just behind the driver's seat. Its position is clear from Figs 2

and 3, and it can be hinged upwards while the pump and mounting are attached to the rear of the Fire Engine.

Take the 2½''x1½''Flanged Plate and bolt it between the side plates of the body as shown in Fig 3. To make up for the slightly narrow overall width of this small Flanged Plate, single spacing Washers are used between the flange and the side plates on all four bolt shanks.

An economy of Nuts and Bolts has to be observed if the model is to be kept within the confines of the No5 Set, and only one Bolt is used to secure the 2'' Pulley to the small Flanged Plate where it also traps a 2½''Curved Strip in place.

Mount a Multi-Purpose Gear on a 1'' Rod and secure this in the boss of the 2'' Pulley to form the turbo pump.

Use a ¾''Bolt to secure the ½''Pulley with Boss to the upper left hand hole of the small Flanged Plate, placing a Spring Clip behind the Pulley as a stand-off spacer. The two lower Bolts holding the 2½''x1½''Flanged Plate also hold ½'' Reversed Angle Brackets acting as hose and tackle rests at the sides of the Fire Engine. Two Set Screws are fixed in the ½''Pulley boss to simulate the hydrant hose union.

Now hinge down the cover plates of the water tank and fit a 2½''Strip across its rear end, with an Obtuse Angle Bracket at the left hand end of the Strip. Attach a square-headed white plastic carton-stud (taken from the outfit carton), to the Obtuse Angle Bracket with two Nuts to form the control valve. Standard Meccano Nuts will quite happily thread on to the shank of these plastic studs. All the construction just mentioned is clearly shown in Fig 3.

THE REAR MUDGUARDS

Rear mudguards may now be fitted, and these are formed from a pair of 5½''x1½'' Flexible Plates. In the model illustrated, the first ½'' of the Plates was set between a pair of Angle Girders so that a sharp right angle bend could be set on the end which is then trapped underneath the rear end of the 5½''x2½''Flexible Plates already forming the chassis floor.

The D A Strips below then receive their second Nuts & Bolts to hold the forward end of the rear mudguards in place.

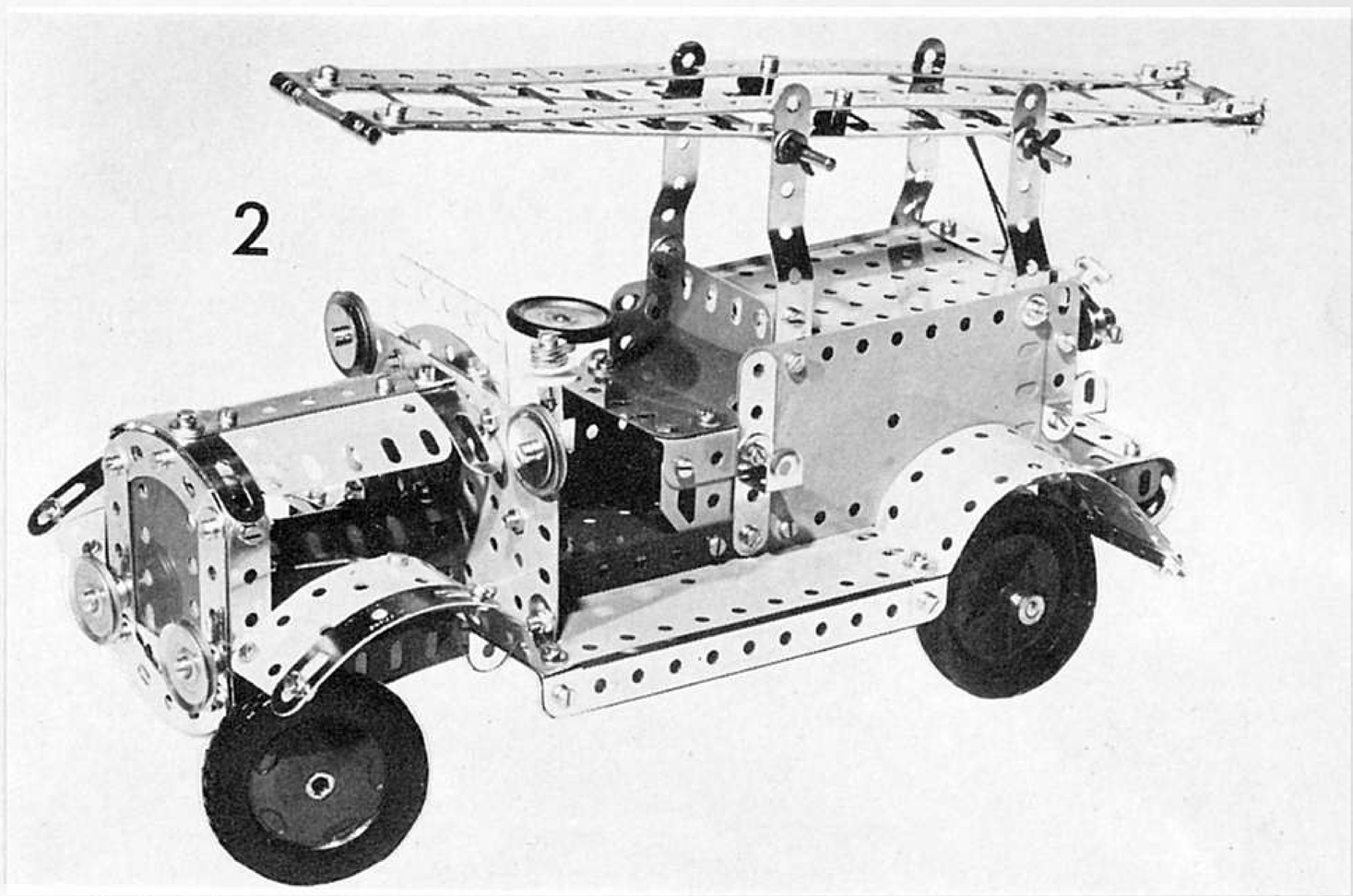
Experienced constructors retain Flexible Plates, in which they have set bends, for use in other models but, for the younger modeller who does not wish to make sharp bends in Flexible Plates, the forwards ends of the rear mudguards may simply be pushed just below the rear edge of 5½''x2½''Flexible Plates and attached thereto by ordinary ½''Brackets.

A smooth and gentle curve is set into the 5½''x1½''Flexible Plates to complete the contours of the rear mudguards, the tail ends of which are sandwiched by a pair of 5½''Strips holding an Obtuse Angle Bracket in their centre which is, in turn, bolted to the centre edge of the underpart of the 'U'-shaped Flexible Plate. Figs 3 and 4 make the construction quite clear.

THE 'CAB'

A pair of Flat Trunnions make vertical supports for the driver's seat, and Bent Trunnions form the ends of the bench as seen in Fig 6. One Transparent and one Blue 2½''□Plastic Plate form the 'upholstery' of the bench seat, being fixed with two Nuts & Bolts only, their rearwards and upper curvature giving a rigid form to the seat.

On the leading edges of the water tank side plates, 2½''Strips add reinforcement and support for the rear holes of the Bent Trunnions, at the same time holding ½'' x



Further view of complete model showing steering lock and fittings around the bonnet

½''Double Brackets as the forward hose and tackle supports.

Fig 6 shows some of the details in the driving compartment where the dashboard bulkhead is the second 4½''x 2½''Flat Plate bolted centrally to the forward flange of the large Flanged Plate with one Bolt at the right, and located at the left by the Crank Handle forming the exhaust pipe as it passes rearwards from the engine compartment.

A 3½''Strip is mounted as shown by Obtuse Angle Brackets to form the foot pedal board, and two more plastic carton-studs do duty as clutch and foot brake pedal, each being stood off with a Spring Clip as spacer, and locked from below by a single Nut.

A transparent Plastic 2½''x1½''Plate forms the wind shield, and is supported by the overlaid 2½''Curved Strip. ¾'' Washers and 9.5mm Bolts hold 1''Loose Pulleys to the corners of the bulkhead as side lamps, one Fishplate being used as a driving mirror on the offside.

Various illustrations show firebell, a ½'' Plastic Pulley with three Washers mounted on a ¾''Bolt passing into a Rod & Strip Connector on the nearside corner of the bulkhead.

THE STEERING GEAR

Steering gear can now be given attention, a Bush Wheel being bolted to the last 2½'' D A Strip. The second Bush Wheel is bolted to the upper side of the front Sector Plate with its centre three holes back from the front edge. It should be noted that the Meccano Bush Wheel will not bed down flat on a Plate etc, because of the ridge on its boss. Advanced constructors use Meccano Electrical thin Brass Washers [Part 561] to pack out this difference, but younger modellers can do the same thing by making paper washers to take up the slight gaps (about postcard thickness will do).

By studying Fig 7, the position of the Bush Wheel can be clearly seen, and at the same time as this is fixed, the 1''x½'' Double Bracket is mounted under the leading edge of the Sector Plate as shown. This will form part of the bonnet mounting.

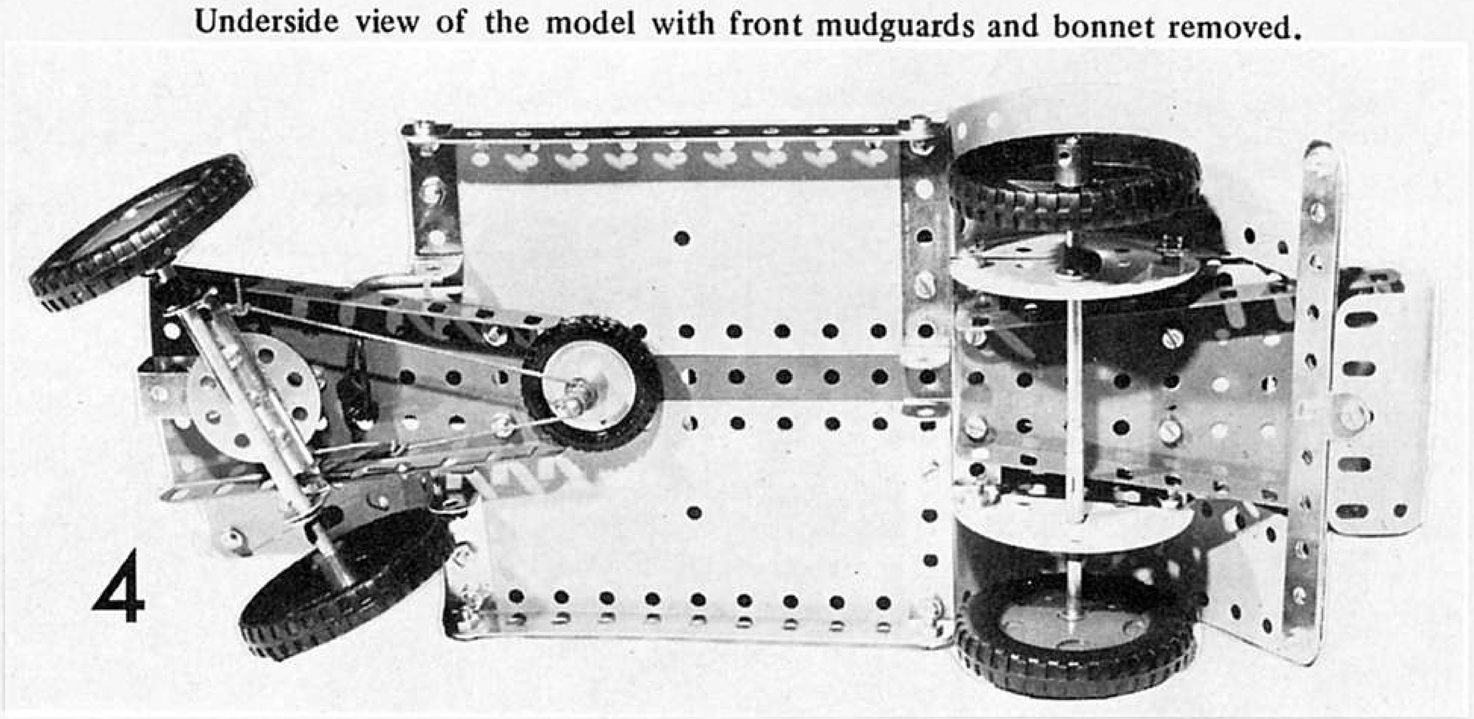
Fix a 1½''Rod into the lower Bush Wheel carrying the D A Strip, add a Spring Clip as a spacer, and then a Washer, and pass the Rod up through the Bush Wheel on the Sector Plate and put on a Spring Clip to hold the Rod in the right position for a free (but not sloppy) swivel.

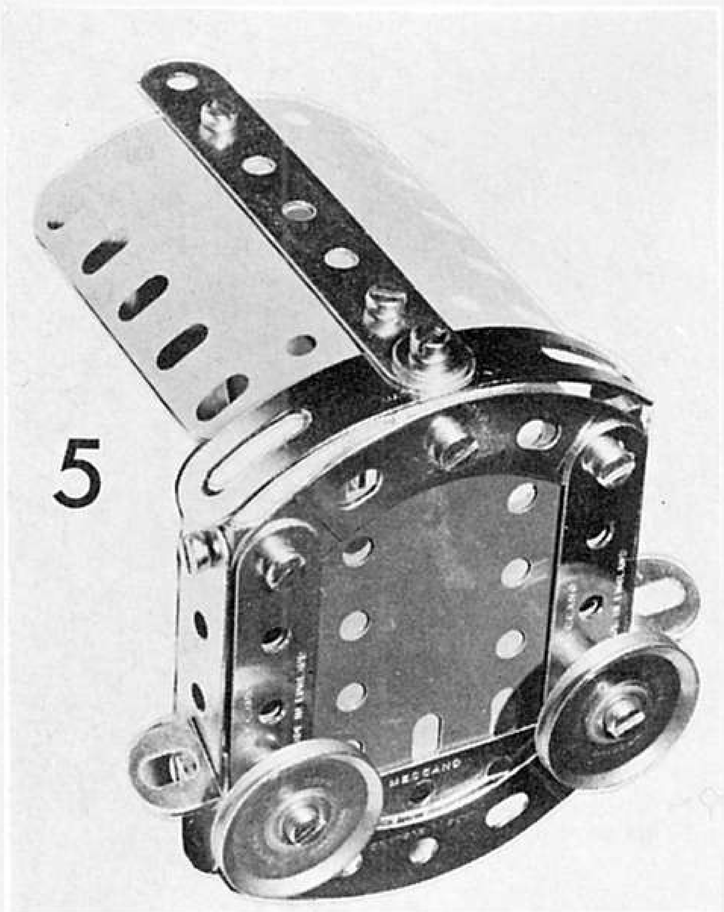
THE ENGINE

Now the 'engine block' can be made from one 2½''□, and one 1½''x2½''Blue Plastic Plate curved gently into a 'U' shape as shown in Fig 7 and then laced with a short length of Meccano Cord to retain its shape. The second Plastic Gear Wheel is attached to the top hole front of the 'block' by a Bolt and Washer, screwing directly into the tapped hole of the boss.

Now tuck the loop of a Spring Clip through the second slotted hole of the plastic plate close up to the 'fan', slide the cranked portion of the Crank Handle firmly into the Spring Clip. Take the 6'' Driving Band and pass it round the 'block', through the Sector Plate holes →

Underside view of the model with front mudguards and bonnet removed.





Above, bonnet and radiator sub-assembly. Below, details of driver's compartment (top) and close-up of simulated engine (bottom)

as shown, and secure it below by looping its ends through and over the bow of a Spring Clip.

THE BONNET

Fig 5 shows the full details of the bonnet, which is made up as a separate sub-assembly. The radiator is backed by a 2½"□Flexible Plate which sandwiches a 2½"x1½"Blue Plastic Plate against the upper 2½"Curved Strip and the 2½" straight Strip at the bottom.

Headlamps consisting of 1"fixed Pulleys are bolted on by ½"Bolts two holes up the side 2½"Strips, and are backed by ½"Angle Brackets. Two more ½"Angle Brackets are fixed outside at the same level as attachment points for the front mudguards.

A 2½"□Curved Plate forms the bonnet and is held in place by a 3½"Strip attached to a ½"Angle Bracket at the top of the radiator, a Formed Slotted Strip being secured by the same Bolt as shown. Fig 1 shows how the bonnet is secured to the driving compartment bulkhead by a ½"Bracket set over the top of the 3½" Strip, and a second Formed Slotted Strip.

Finally the radiator is secured to the 1"x½"Double Bracket under the Sector Plate by a Bolt passing through the centre hole of the 2½"Strip running across the bottom of the radiator just behind the lower Curved Strip.

THE FRONT MUDGUARDS

To make two front mudguards, two 2½"x1½"Flexible Plates are given a right-angle bend and bolted under the leading edges of the chassis floor. The underview of Fig 4 shows two 1½"D A Strips bolted on below, and these support the bent rear edge of the mudguards. Again, if constructors do not wish to bend their Flexible Plates so sharply, the rear ends may be passed below the chassis floor level and secured by Angle Brackets or 1½"Angle Girders.

To complete the curvature of the front mudguards, 2½"x1½"Trianglular Flexible Plates are lapped on each other to form rectangular extensions, and are reinforced by Formed Slotted Strips set slightly forward to give the 'period' look to the mudguards.

WHEELS AND STEERING

Wheels and steering may now be fitted. For the rear axle, a 4½"Rod is extended by a 2"Rod as shown in the underneath view of Fig 4, and the wheel faces are reversed to give the 'veteran' look. Washers and Spring Clips set the wheels to a suitable spacing.

Another 4"Rod forms the front axle, spacing again being set by Washers and Spring Clips.

A 3½"Rod forms the steering column, topped by a 1"fixed Pulley with Flexible Ring. Double Spring Clips and a Washer locate the column above the large Flanged Plate in the centre line three holes back. Underneath the chassis, a 1" fixed Pulley with Motor Tyre makes a perfectly satisfactory lower bearing for the steering column, being left to lie snugly against the chassis floor with no real fixing other than the Washer and Cord Anchoring Spring seen in Fig 4.

A short length of Meccano Cord is tied to one outer hole of the D A Strip of the steering gear, wrapped three turns round the lower end of the steering column, knotted through the eye of the Spring, and then secured via the 2½"Rubber Driving Band to the other side of the D A Strip. This keeps a permanent tension on the steering cord giving very positive steering.

COMPLETION OF THE CHASSIS

Final strengthening of the chassis is made by bolting the lower corners of the driving compartment bulkhead plate to the rear end of the front mudguards by ½"Angle Brackets, and by adding a 5½"Strip at each side of the Fire Engine to reinforce the 'running boards' at chassis floor level. Extensive use is made of mutual bracing between components, resulting in a very rigidly-constructed model for such a modest outfit.

THE LADDER

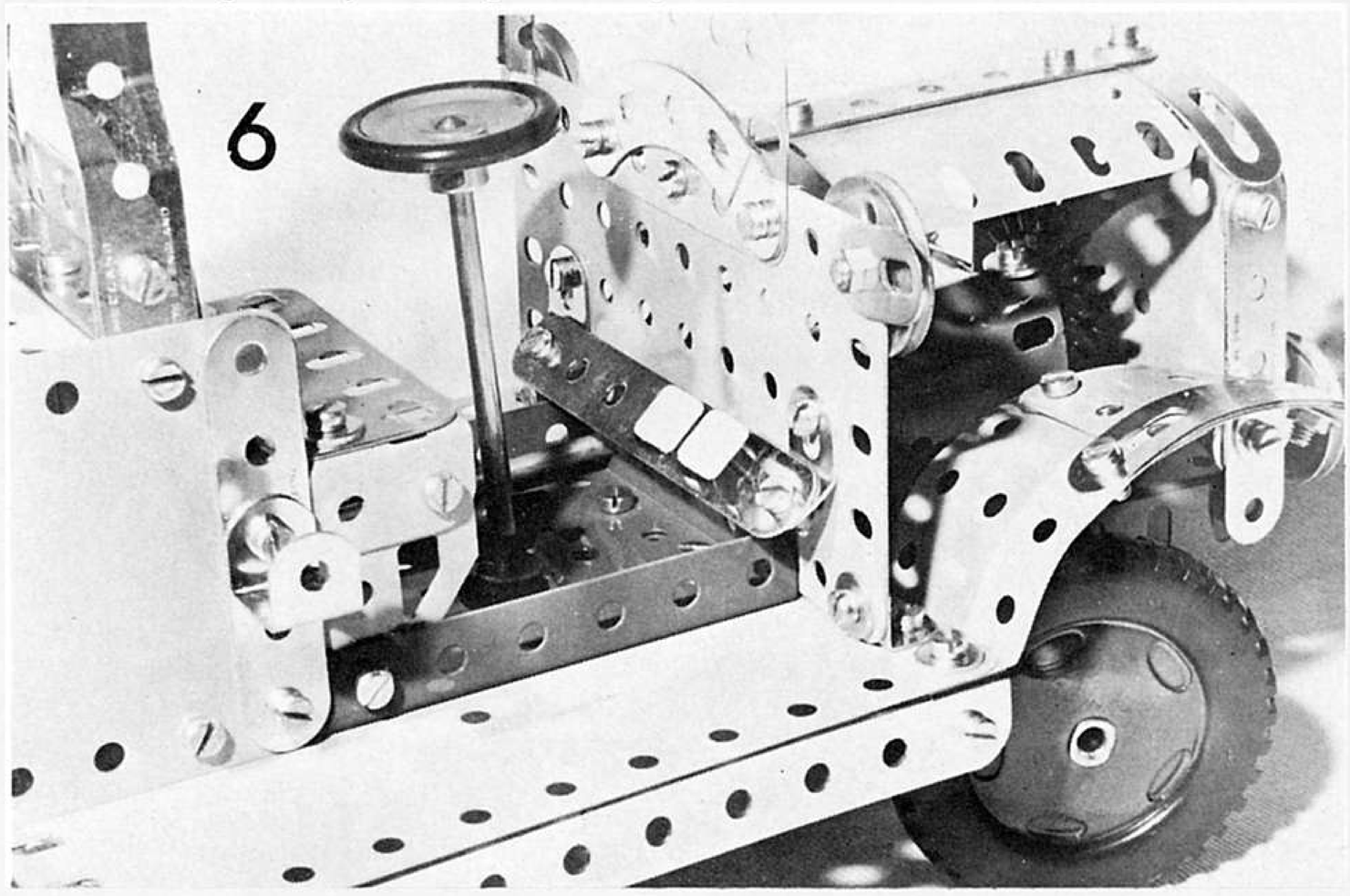
It only remains now to make the ladder, a very simple but neat-looking job, which requires a little patience and very few parts to assemble.

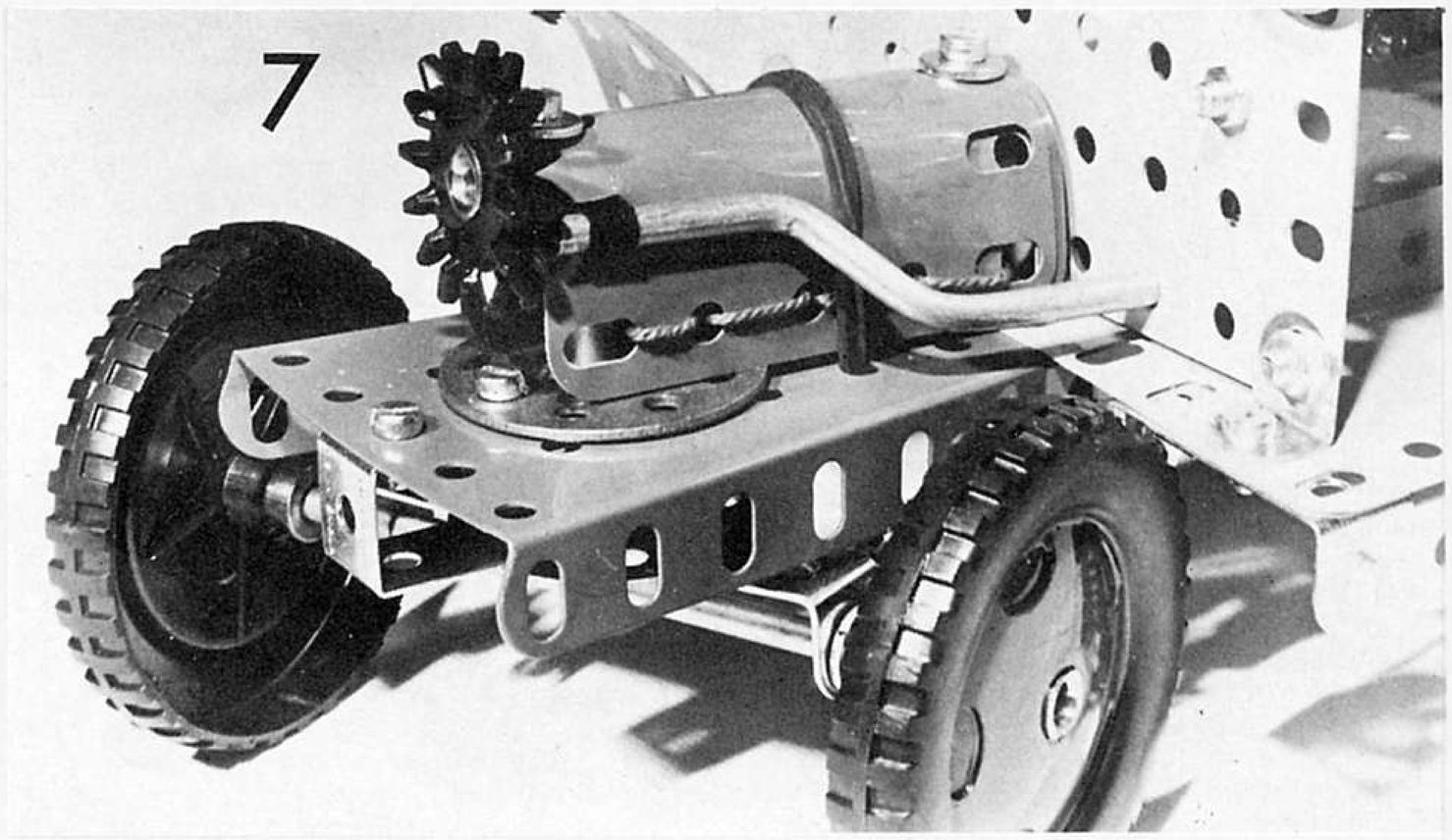
Start by taking a pair of 12½"Strips and the remains of the Hank of Meccano Cord. Lay the strips about 1½" apart, and then — with a doubled loop of Cord — thread the rungs of the ladder through each second pair of holes in the two Strips, taking guidance from Figs 1, 2 and 3.

Now attach a second pair of 12½" Strips, joining them at the top of the ladder by Bolts passing through Right Angle Rod & Strip Connectors sandwiched between the Strips. The loop in the end of the doubled Meccano Cord is trapped under the Strip by one of the Bolts.

Fit a 1½"Axle Rod into the Rod Connectors, making sure that a good grip is maintained (if necessary by squeezing the tubular section with a pair of pliers). If the Connector already has a tightly curved section, use a Bush Wheel on your short Axle Rod to push it into the Connector. It needs to go in only 3 or 4 mm to obtain the correct ladder spacing.

The cantilever effect at the centre of the ladder is achieved by using Spring Clip spacers which simply cling to the shanks of 9.5mm Bolts, clearly shown in Figs 1 and 2. At the lower end of the ladder, standard Nuts & Bolts are used to fix Fishplates by their round holes to the end of the 12½"





Strips, leaving the Nuts slightly slack. A 2'' Rod is then trapped between the slotted ends of the Fishplates by 9.5mm Bolts, all Nuts being tightened in sequence.

Before the final tension is put on these nuts, 'square off' the ladder and draw the Cord, rung by rung, from top to bottom of the ladder until all rungs are under equal tension. Then tighten up the end of the Cord under one of the Fishplate pairs and wrap a few turns round the lower Rod as shown in Fig 3, to centralize the Cord on the bottom rung.

At this stage, the modeller has the choice of leaving the 5½''Strips supporting the ladder in an unbent state, although the illustrations in this article show a cranked bend set into them for the sake of appearance. Taking the last two 3½''Rods in the No5 Set, these are placed through the ladder supports and located by Spring Clips and Washers. If the end of the Cord is then knotted, it can be passed over the rear Rod of the ladder supports and over the Plastic Gear on the turbo pump to hold the ladder in its travelling or stowed position. The arrangement should be clear from Fig 3.

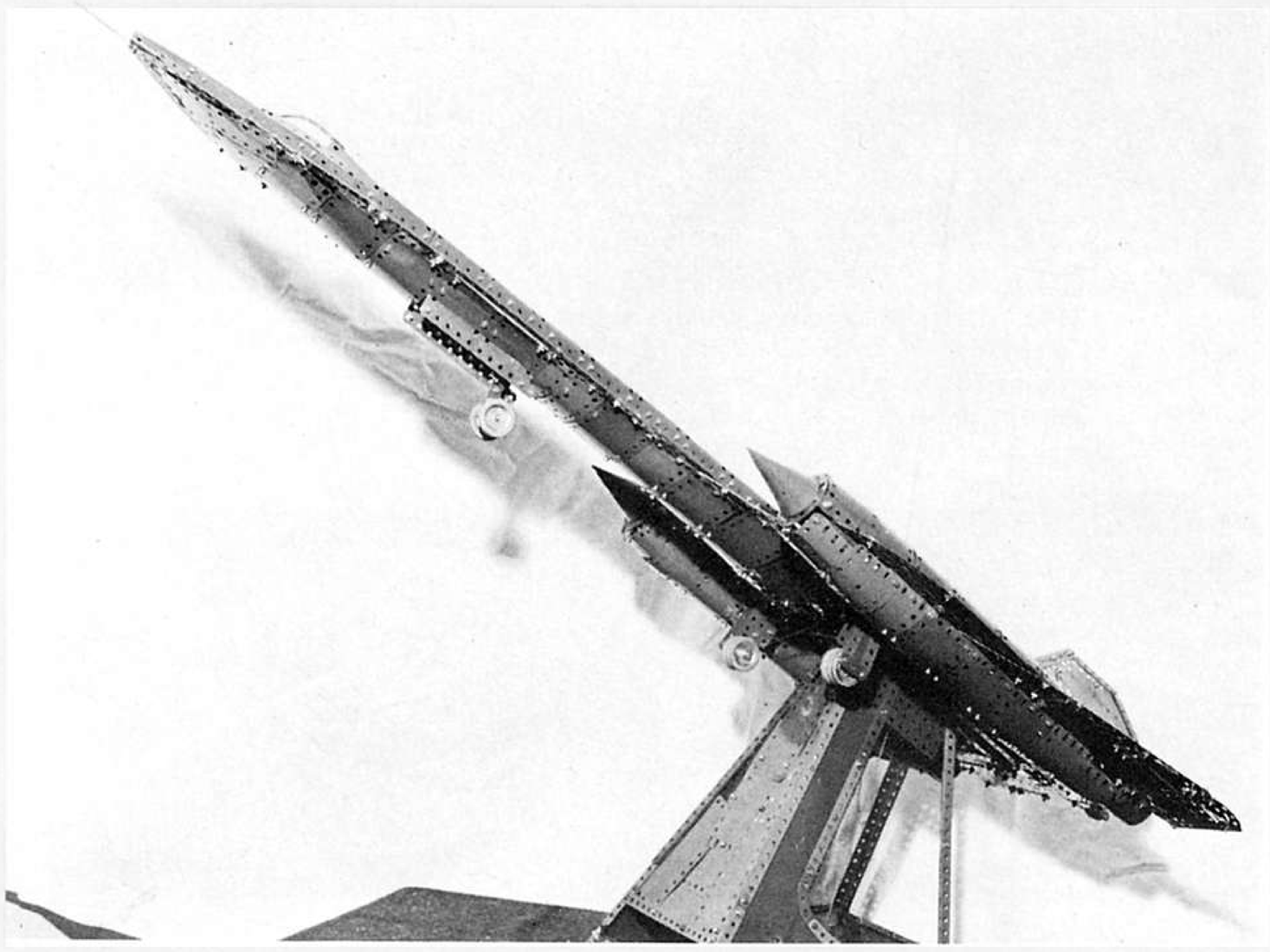
IMPROVEMENTS

Because this model has 'solid' front and rear axles, steering is not as efficient as it might be. If the front axle is replaced with a Rod which is ½'' longer, one Road Wheel may be fixed to the Rod and the other left free to revolve on the axle, held in place by Washers and Spring Clips or Collars. This will give an immediate ease to the steering.

Again, if the composite rear axle is replaced by a 6''Rod and one wheel is also left free, steering will be further improved.

Modellers with a few extra parts can fit various fire fighting gear, extinguishers, hydrant hoses in the side brackets etc. There is still a pair of 3''Pulleys left in the No5 Set, and as the Dennis Fire Engine was supplied either as a straight-ladder or wheeled-escape type, this second version might be made from the contents.

Right: the author's SR 71 'Blackbird' mentioned in the text.



THAT NEXT MODEL

by Frank Beadle

There must be few Meccanomen who are at a loss as to what to build next, indeed most of us have several ideas stored at the back of our minds, having seen some mechanism of interest or an appealing Super Model of the past.

In fact, it is more probable that one is usually in a situation of interesting perplexity, in deciding 'which' and not 'what' to build next, from the ideas and thoughts which accumulate from time to time, even when one is engaged in the construction of a particular model and something is seen that will form the basis of a project in the future.

Models however, generally fall into three categories either from their origin or from the particular idea, and these can be grouped as follows:

EXISTING OR PREVIOUS MODELS

Many builders prefer to work from Supermodel Leaflets, or from a feature in the Meccano Magazine, which illustrates or describes, and has construction details together with a list of parts. Whilst not decrying this type of building, there are other approaches to Meccano modelling, yet the Blocksetter Supermodel of 1923, even if followed step by step, still can offer the most interesting problems when dealing with the tolerances of the cab mechanism gearing, or the cording of the working parts in general.

It is not just a matter of assembly in a repetitive, bit by bit fashion, as the 'proof of the pudding' as it were, lies in the final completion and the operation of the model in a sewing machine quietness and efficiency.

If one tackles an Andreas Konkoly model, it is not long before one is beset with the fine clearances and tolerences which that wizard always seems to incorporate. So, working from the existing literature of models built and tried still offers some stimulating thought, and forms an important part of one area of model selection.

FREELANCE EXISTING PROTOTYPES

This type of building falls into the second category of representing actual things in the everyday world, or beyond, such as the 'Star Trek' *USS Enterprise* model, recently featured by Meccano Ltd on the pre-Christmas Television Commercial shown in some parts of England, or an Oil Rig, or perhaps the SR71 Lockheed *Blackbird*, or a recent modern lorry-mounted crane.

The item is nearly always of topical interest to the general public at exhibitions, and has the added value of letting the public at large know that Meccano is up-to-date and not confined to the 'steam age' model of the past — fascinating as these are with their more exposed framework than the streamlined appearance of things seen in the industrial and scientific world of today.

Anyone who has not tried this type of model, is advised to have a go and experience the thrill of designing at its very best, taxing the dexterity of thought to the utmost in representing some section with such Parts as Flexible Plates, which really come into their own to form the compound curves of some part of a modern piece of machinery.

Many modellers prefer, as I do, to work from makers drawings. Firms are only too glad to supply general layout details or drawings of their products, providing the courtesy of complimentary photographs of the finished achievement are sent to them when the model is completed. Scaling-down from the actual is an interesting job in itself, and can provide much pre-building thought when one has to work out on paper beforehand a scale from which to start. It could be 10mm to a foot, or more common on the Meccano modular system is one hole to 1 foot.

Conversly, the entire structure may be governed by the turntable for the rotating superstructure, or more likely, a particular wheel size, which will be a positive start to the scale of the project.

Freelance interpretation of existing items is certainly an exciting way to approach model building, and is very satisfying in its outcome.

BUILDING FROM AN IDEA

This offers perhaps the most interesting angle of model building, combining freelance — with its complications and trial and error of design — with a complete exploitation of Meccano parts.

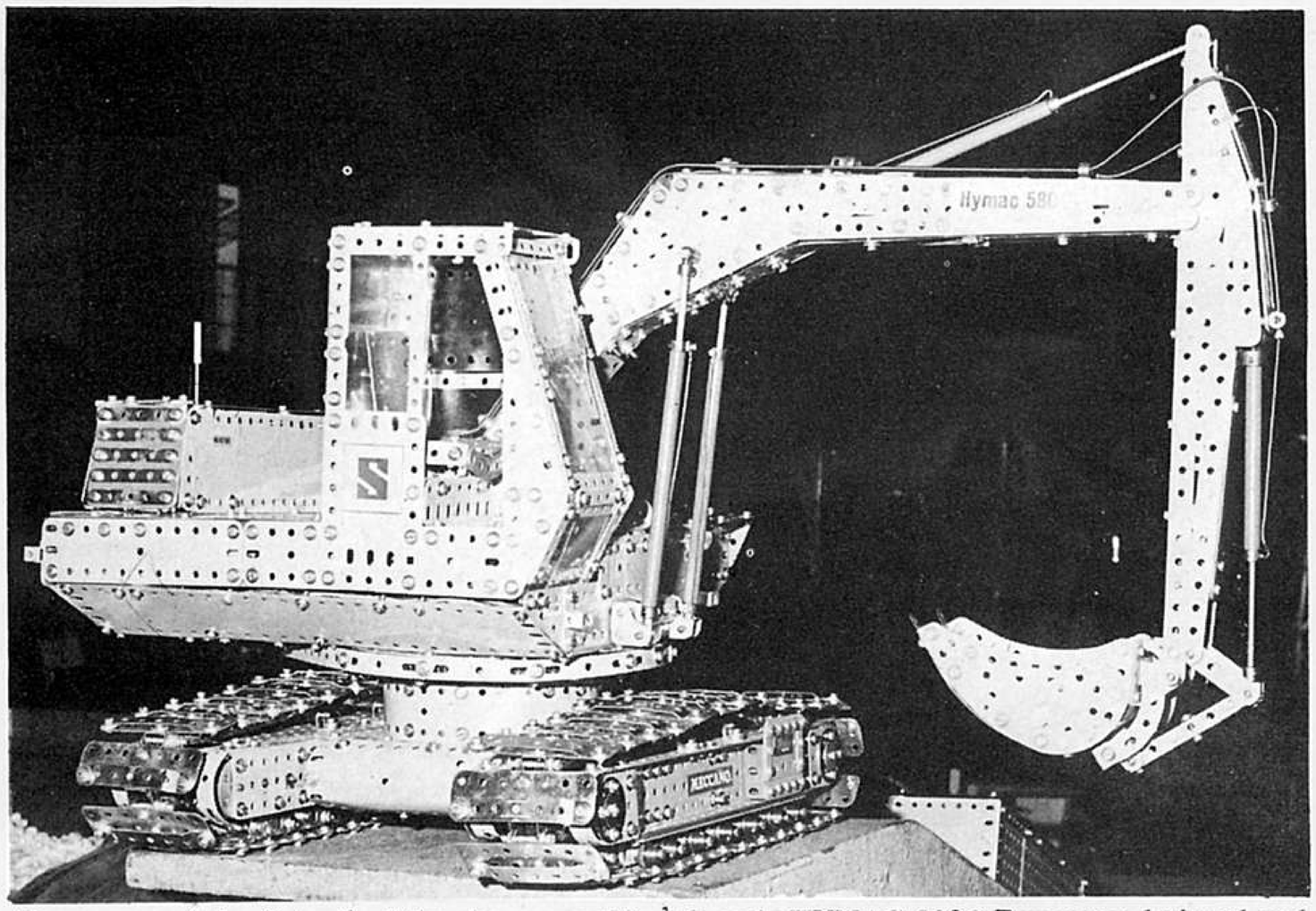
Examples such as the Fence-Building-Machine recently built by Bill Roberts, or the French-Knitting Machine, devised last year by Bryan Reay of the North Eastern Meccano Society, offer the intricasies of an 'idea' which is virtually constructed from the 'inside' focal point of the model, to the frame work structure which is designed as the model progresses with no particular idea of eventual appearance.

If one has the patience to delve into the realms of the unknown to solve a particular problem, or be faced with limitations of space, contriving how to arrive at a solution that will bring the desired model to its final conclusion and satisfactory operation, this category of building does offer the ultimate in Meccano Modelling.

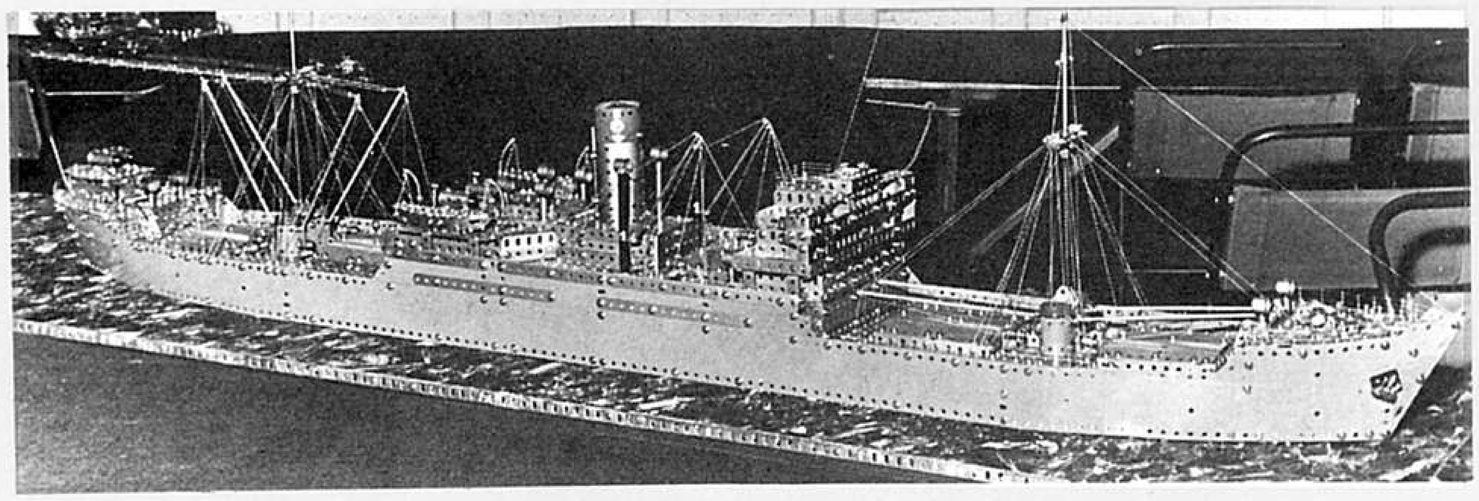
There is no doubt that Meccano is as versitile as us; its limitations are only governed by our own limitations, and its areas of design are boundless. Perhaps the three approaches outlined above may spur some of us to branch out into one or other, or better still all three.

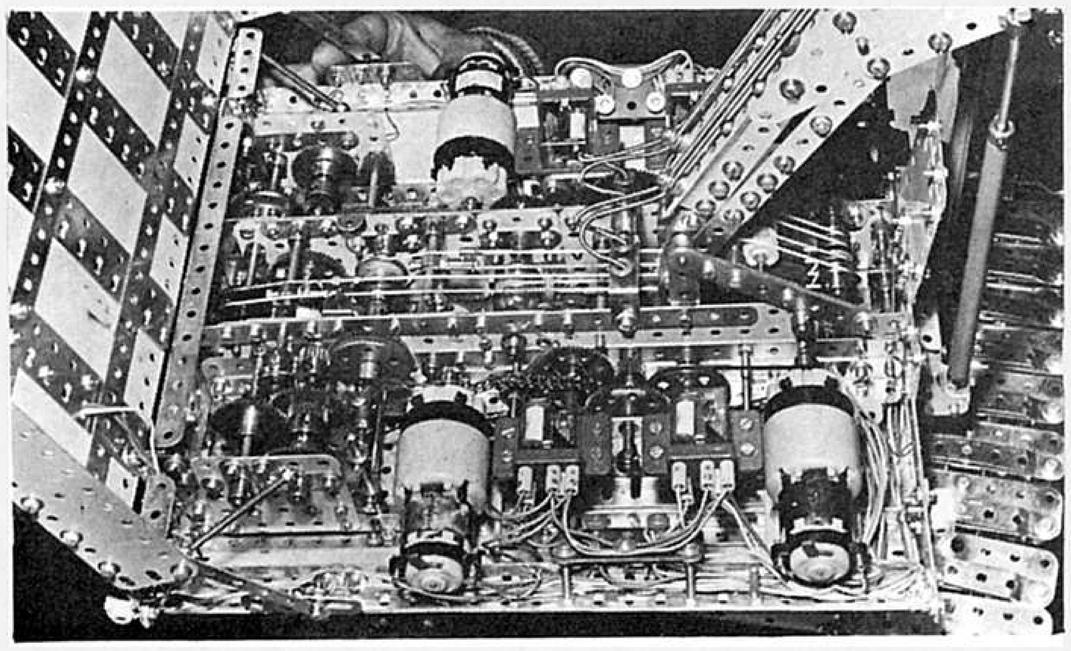
SHOW SC
HEN

A photo-report on the
Exhibition held in Henley-o

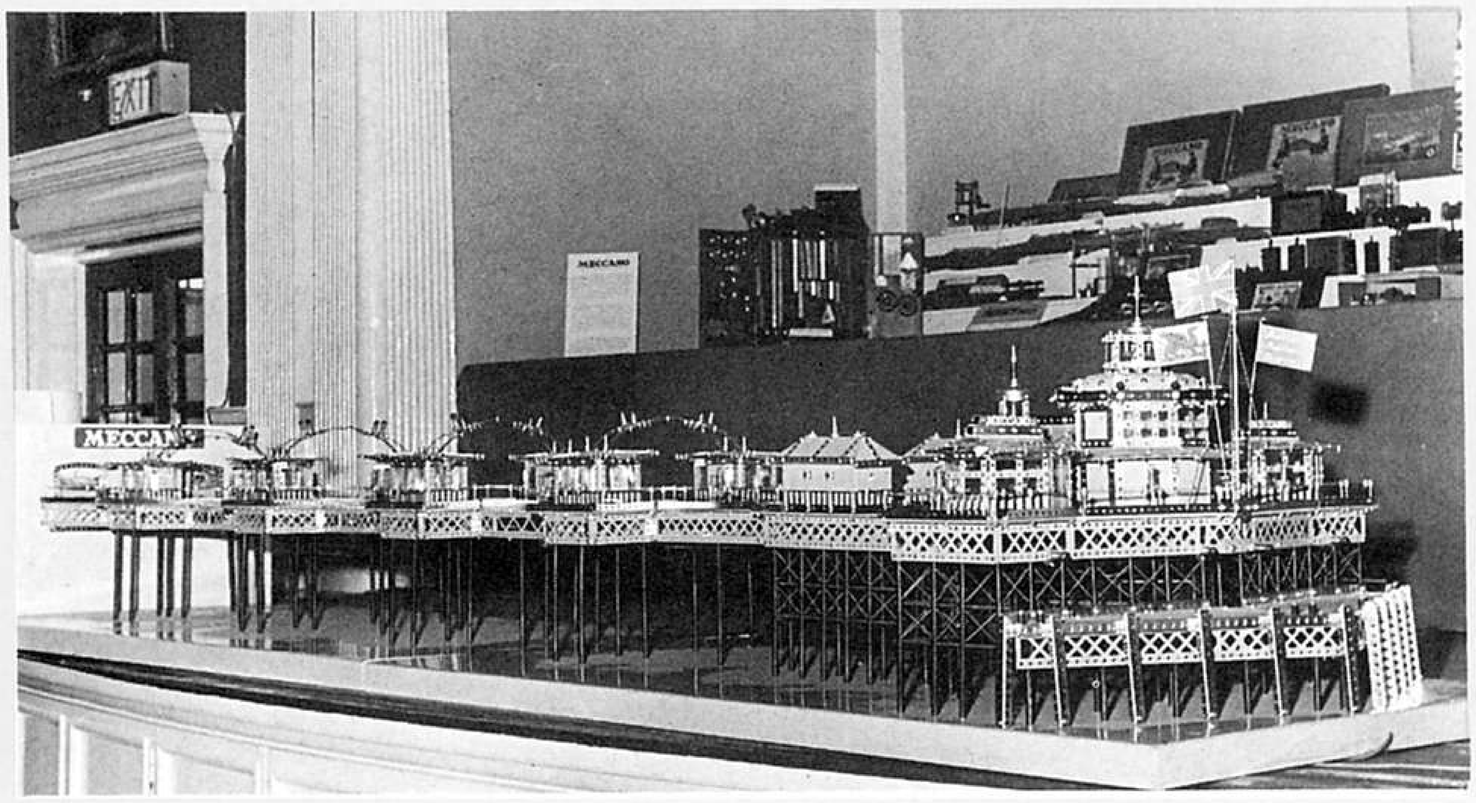


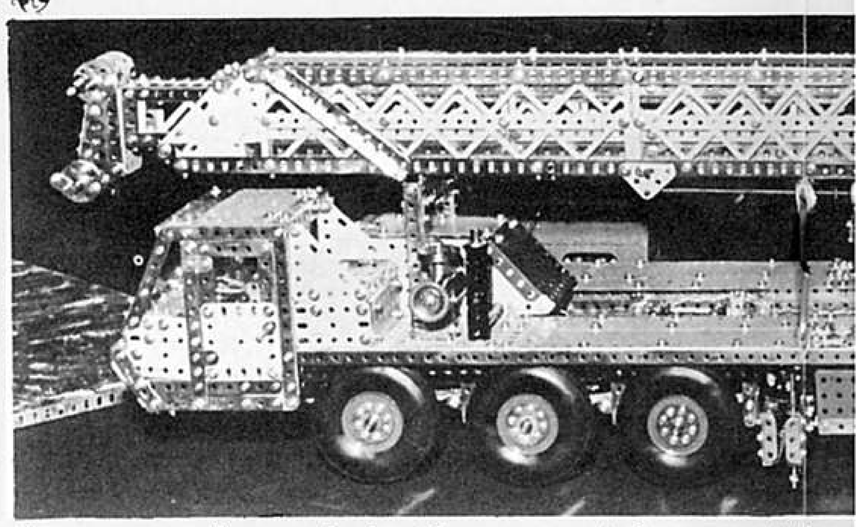
Above, one of the "stars" of the show was this $\frac{1}{8}$th scale HYMAC 580C Excavator designed and built by Tony Rednall of Waterlooville, a member of the Solent M.C. Driven by six Power Drive Units and one Crane Kit motor, it performs all six movements of the real machine. Below, a large and detailed Cargo Boat based on the S.S. Egton and built by Tony Knowles of the Henley Society of Meccano Engineers



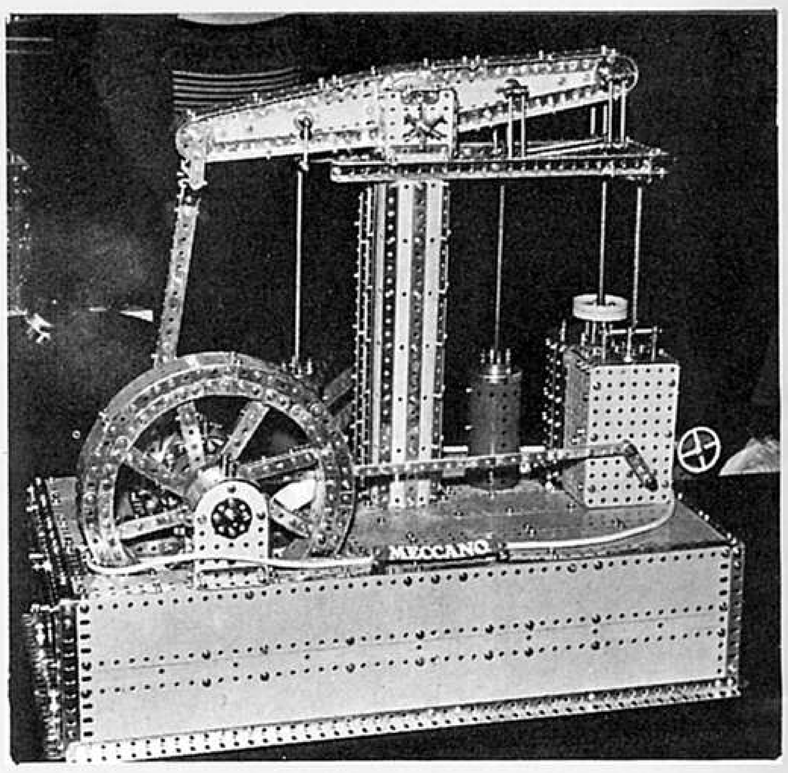


Left, the "innards" of Tony Rednall's HYMAC Excavator - a mass of motors, gears, clutches and relays. Further motors and complex drive systems are carried in the base unit. Below, another giant display piece was this scale model of Llandudno Pier built by Mr. Bert Love, originally for display in Llandudno during the Town's Pier Centenary Celebrations last year

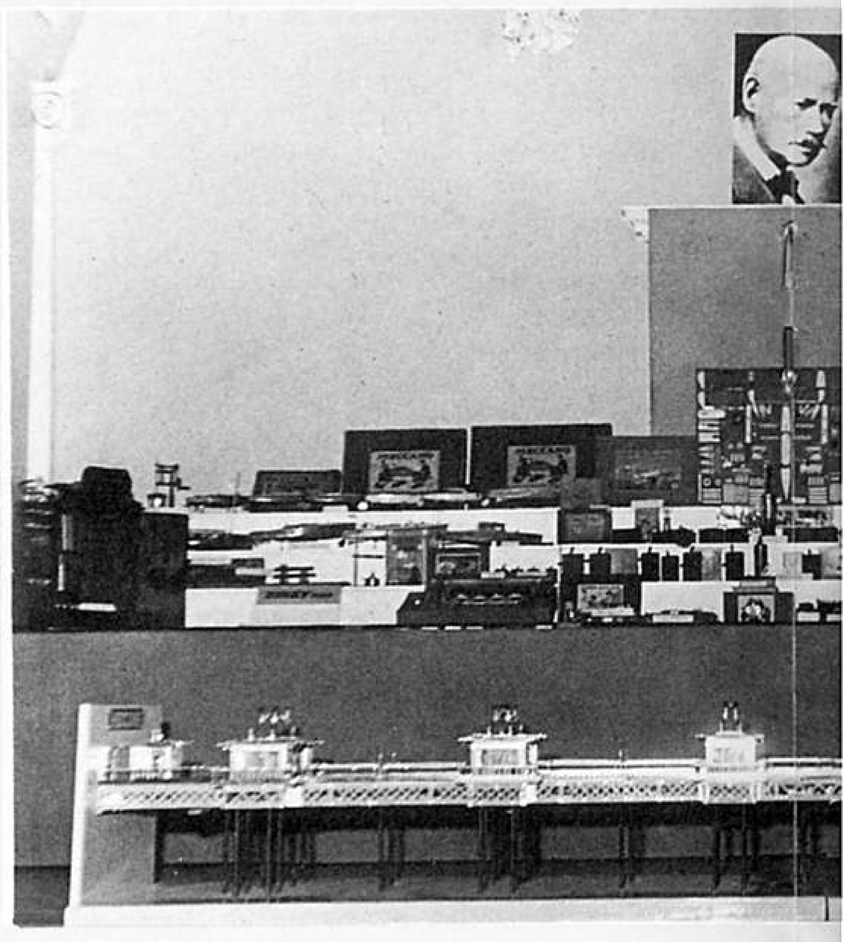




Above, one of several giant lorry-mounted cranes at the s by Bob Ford of Chalfont St. Peter. It performs all opera



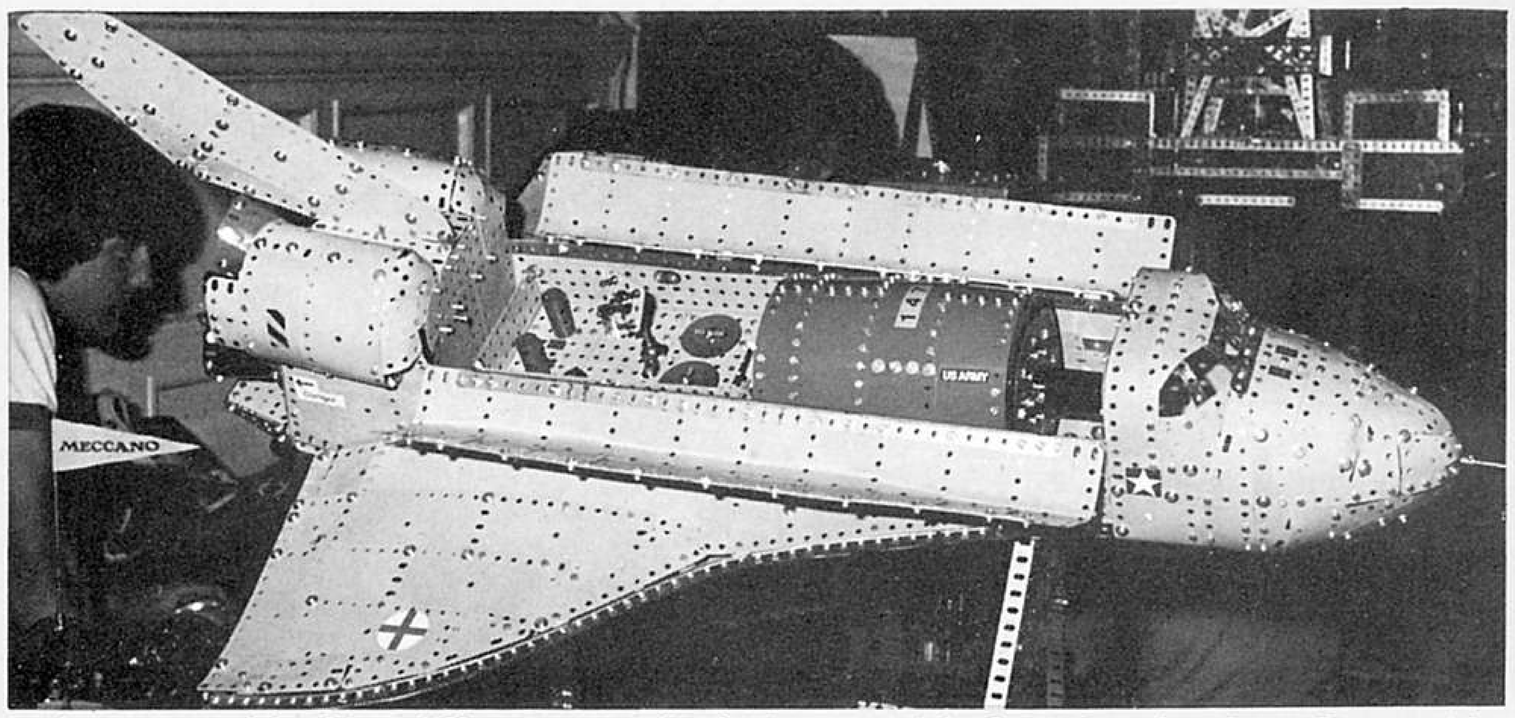
Above left, Midlands M.G. member, Mike Cotterill of Ske a steam-driven water-pumping plant of the past. It feat Above right, a tremendously complex moving ping-pon Tunbridge Wells; you could watch it for hours! Below Meccano Collection and Bert



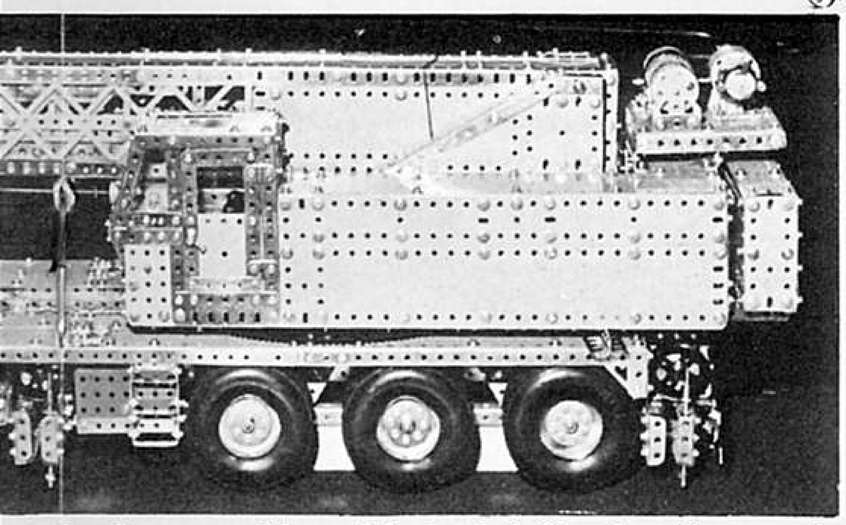
SCENE '77

NLEY

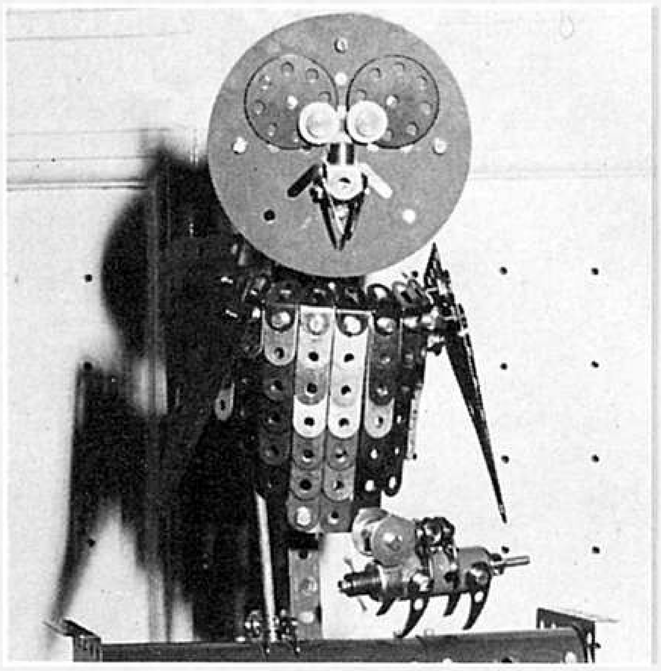
the 6th Annual Meccano
ey-on-Thames 2/3 Sept 1977

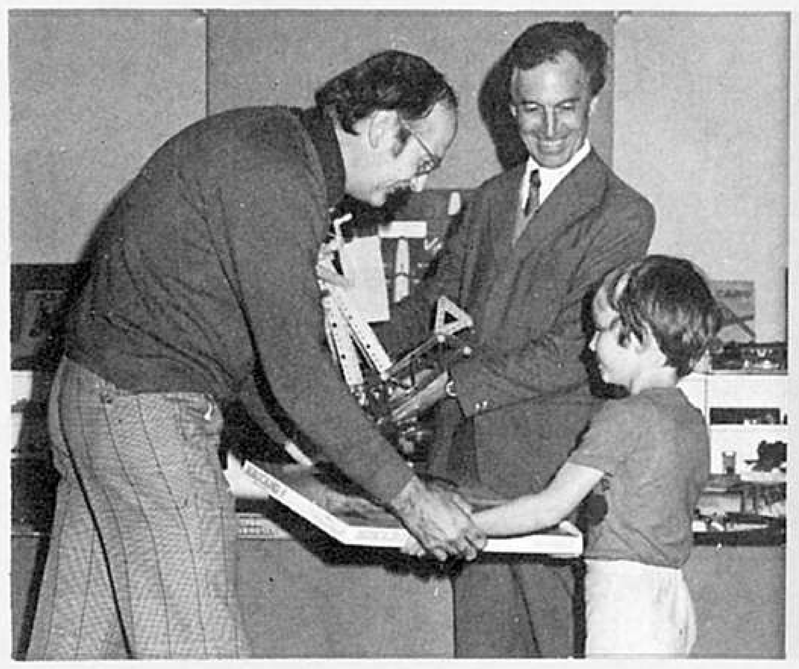


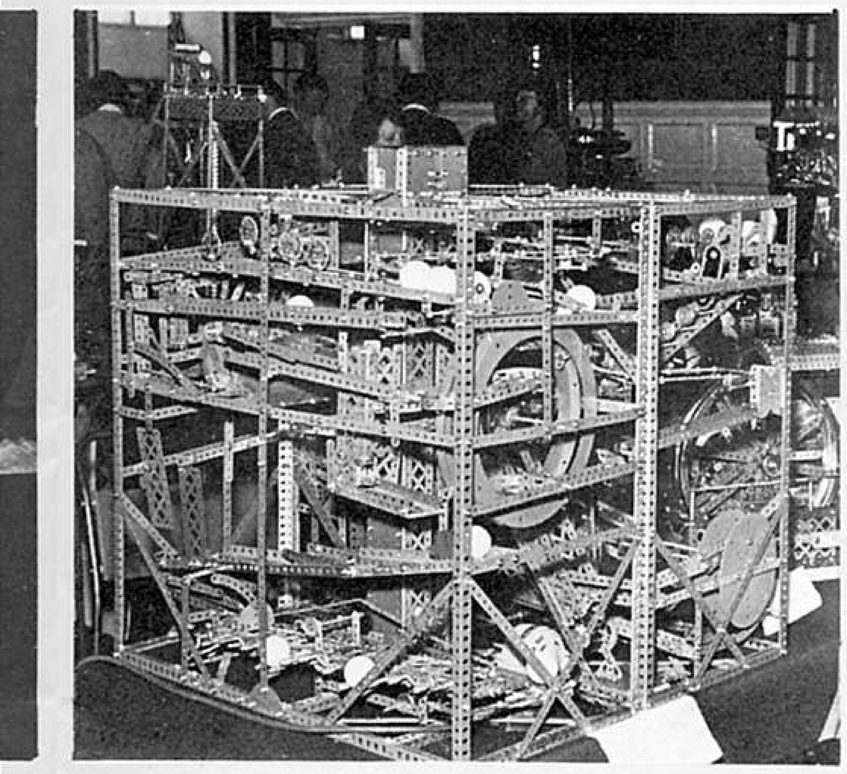
Above, a model with a difference was this freelance model of a Delta-wing Cargo Plane, with opening cargo hold. Unfortunately we did not identify the builder, but we hope he will now contact the Editor so that we may print his name in a future issue. Below left, the prize-winner in the "Under 1 Kilogram" Competition held at the show: an Automatic Mouse-catching Owl! Built by Geoff Coles, the Owl lifts and lowers its head, flaps its wings and raises and lowers the mouse. Below right, young Niggy Thomas, aged 6½, winner of the Plastic Meccano competition, receives his prize of a No. 4 Meccano Set from Mr. Bryan Farrar, Marketing Manager of Meccano Limited. Also in the picture is Mr. Geoff Wright, Exhibition sponsor.



at the show was this multi-wheeled (6 x 2 x 6) example
ll operations of a real machine, powered by five P.D.U's.

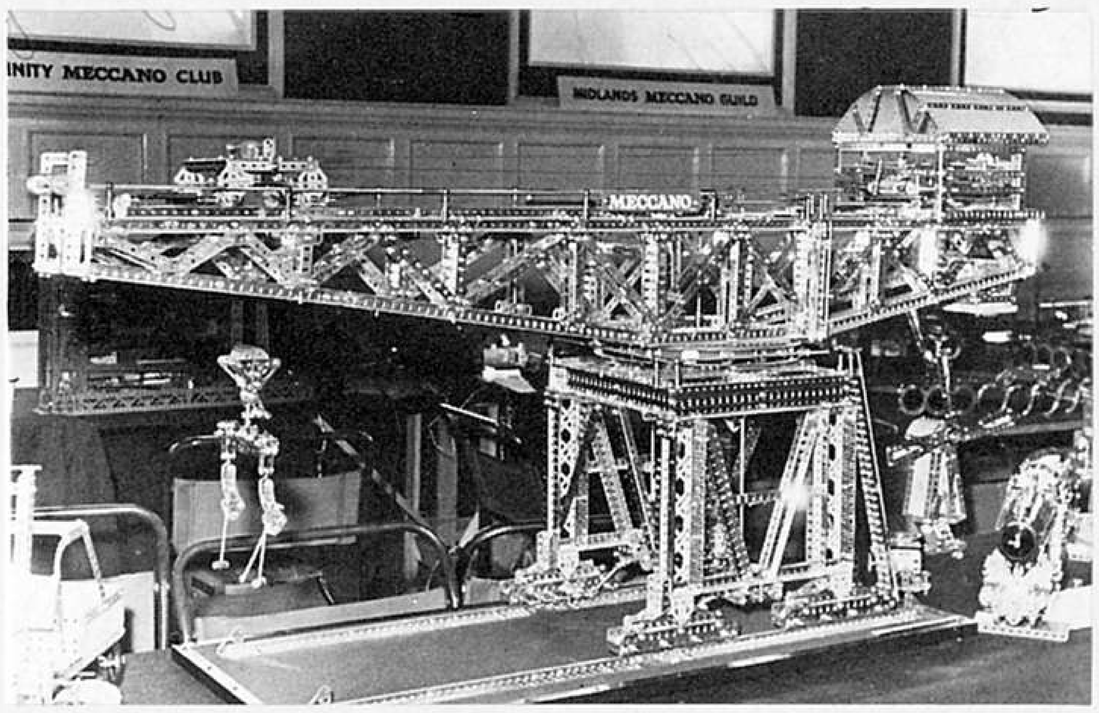


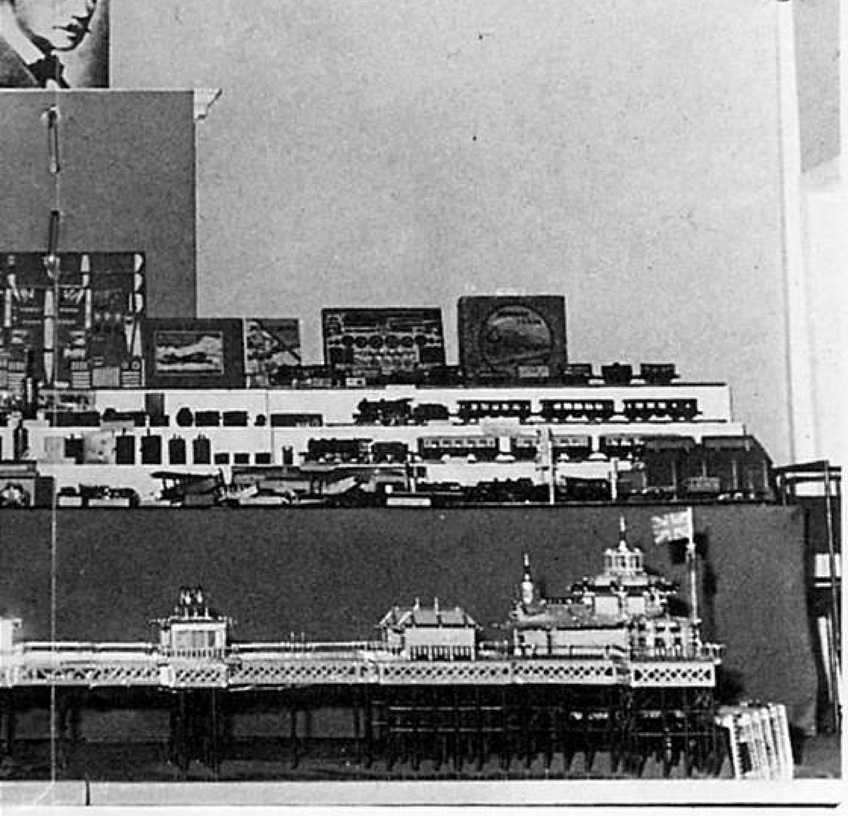


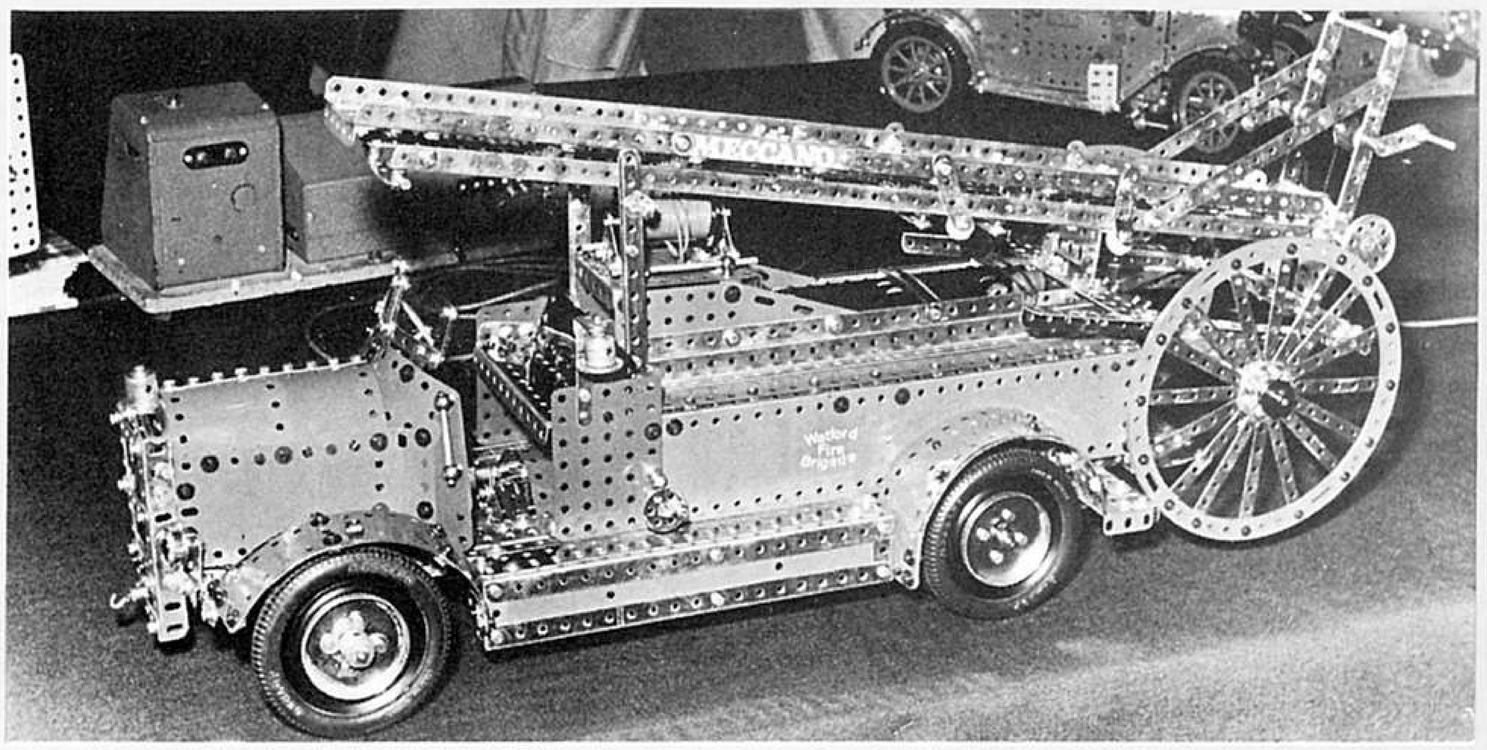


l of Skegness, built this beautifully-proportioned model of
It features an accurate reproduction of parallel motion.
ing-pong-ball display by Robin Schoolar (& family!) of
Below, a view of the stage with Jim Gamble's fabulous
d Bert Love's Llandudno Pier.

Always a popular advanced model with Meccano devotees is the Giant Block-setting Crane-the subject which perhaps more than any other, seems to typify Meccano. This fine example, right, was based on the pre-war Super Model Leaflet No. 4 and was built by Mr. R. Senior of Harlow, Essex. Below, a really superb model of a Scammell Vintage Fire Engine by Mick Burgess of Kettering

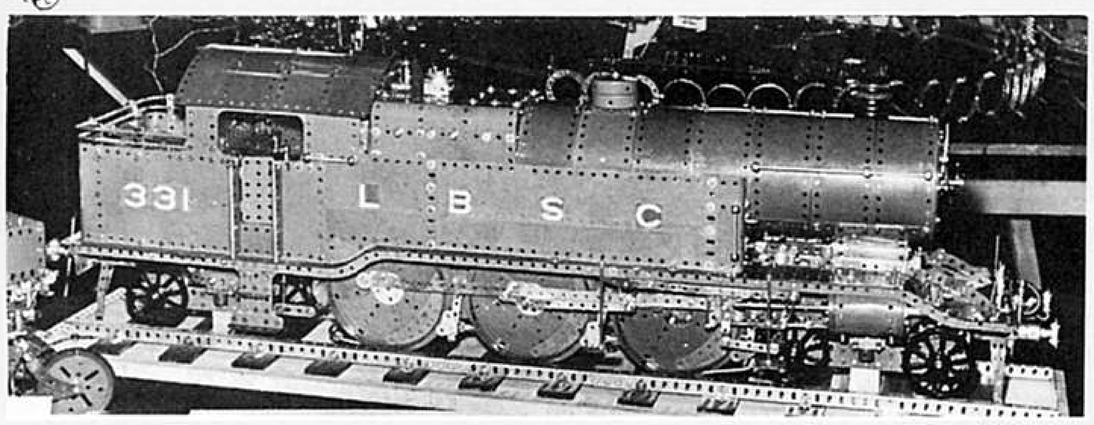




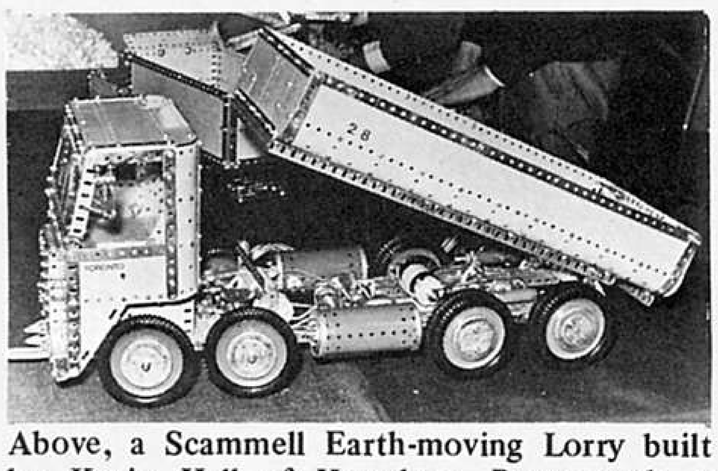


SHOW SCENE '77
HENLEY

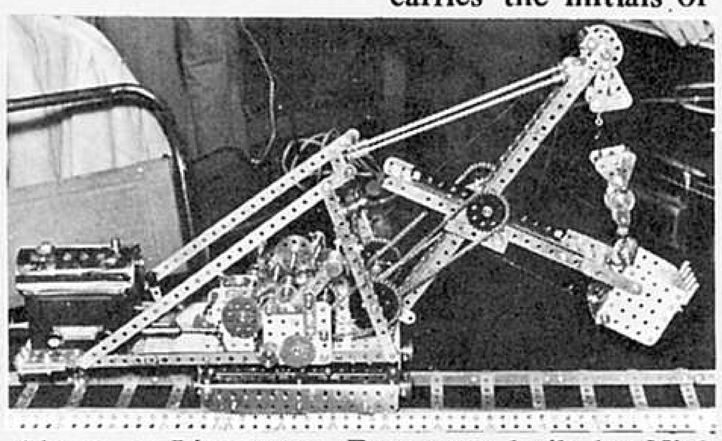
More pictures taken at the 6th Annual Meccano Exhibition



Above, general view of the main exhibition area in Henley Town Hall during the second, public, day of the show. Left, a Class L "Baltic" Tank Locomotive built by Adrian Ashford of Woolwich, London. It carries the initials of the London, Brighton and South Coast Railway.

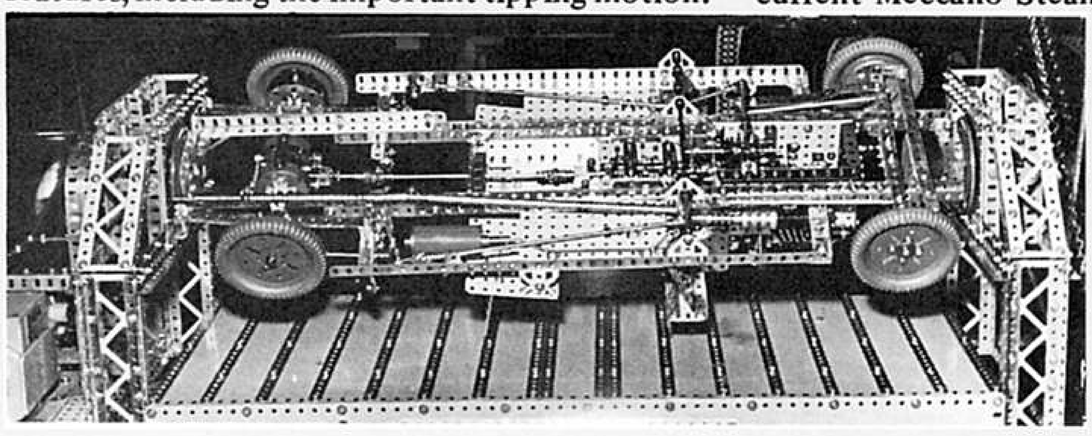


Above, a Scammell Earth-moving Lorry built by Kevin Hall of Horndean, Portsmouth, a member of the Solent Meccano Club, This was a very pleasing reproduction with many working features, including the important tipping motion.

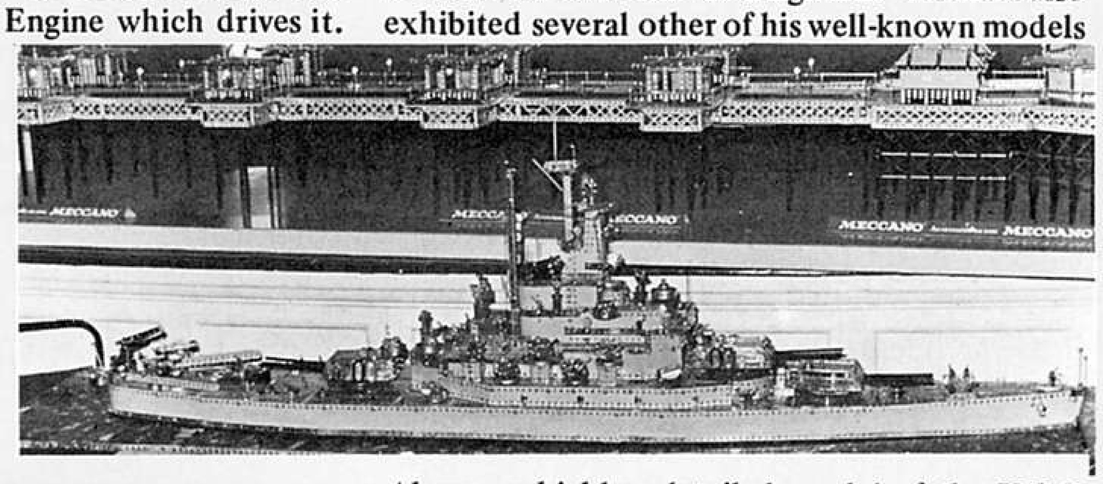


Above, a Live-steam Excavator built by Nick Rodgers of New Haw, near Weybridge. It was based on the pre-war S.M.L.19a model, but was considerably redesigned to accommodate the current Meccano Steam Engine which drives it.

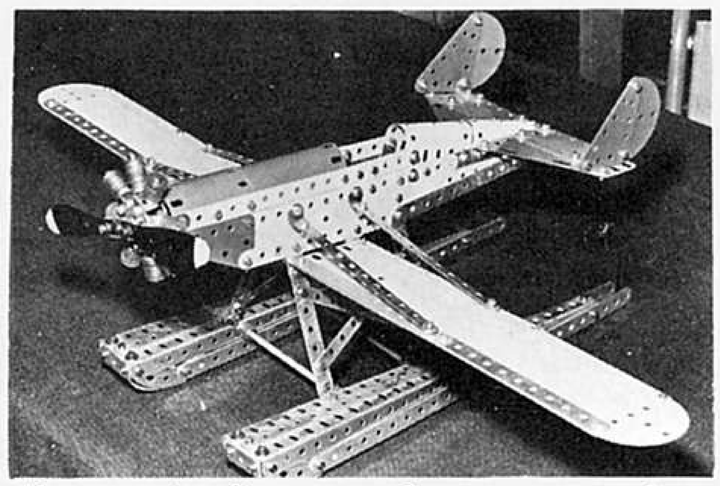
Above, not its first public appearance, but still as eye-catching as ever was this outstanding Vintage Bus built by Michael Edwards, formerly of Watford and now of Brighton. Michael also exhibited several other of his well-known models



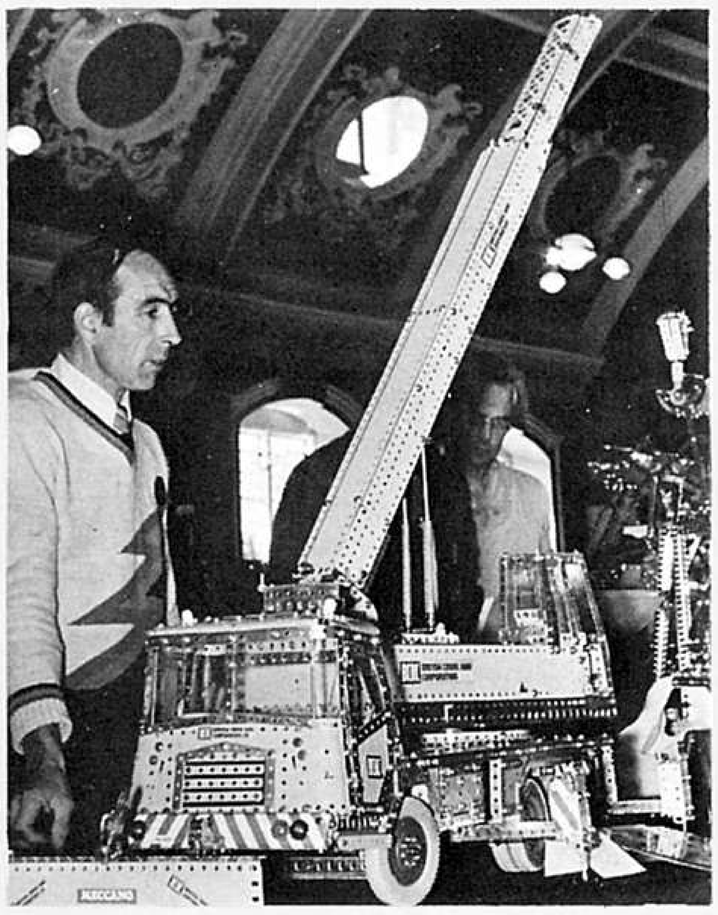
Above, a Motor Car Chassis built as a special display unit by David Guillaume of Alcester. The chassis revolves in its mounting while all the mechanisms operate. Below, Colin Bull of Southampton demonstrates his giant Lorry-mounted Crane based on the Coles Hydra 25T original. Driven by six Power Drive Units, this performs all the movements of the real thing.

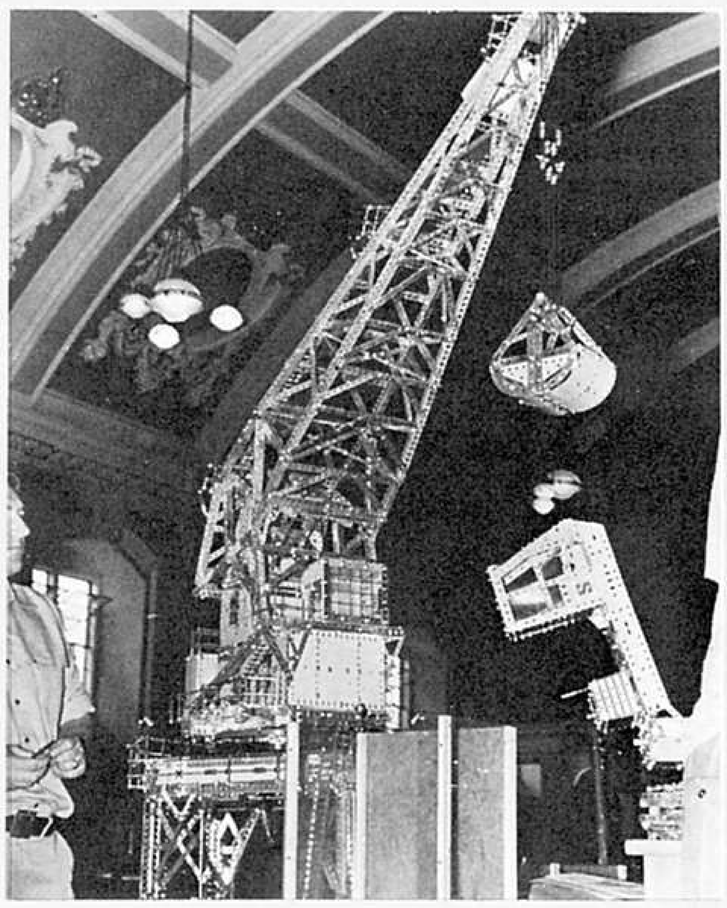


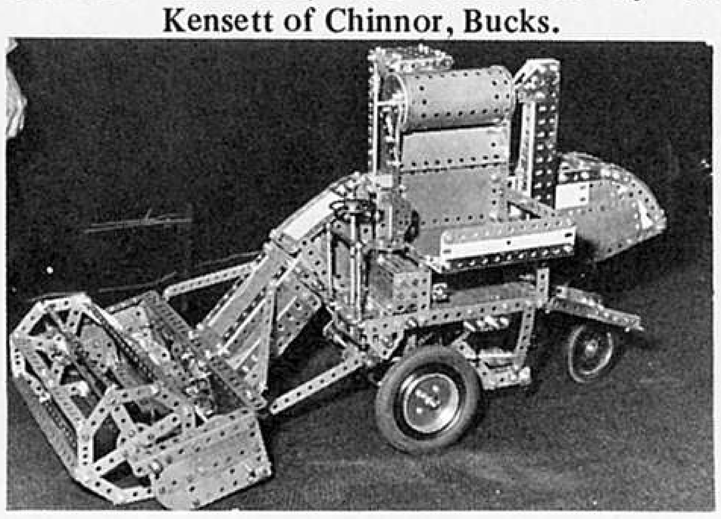
Above, a highly detailed model of the U.S.S. Massachusetts built by Brian Gulley of Basingstoke, Hants. Some 7 feet in length, it reproduces all the major features of the original. Below, another of the giants was this enormous 1/24th scale of a 15-ton Level-luffing Grab Crane model built by Eddie Oatley of Edgeware, Middlesex. It is fully operational.



Above, not quite so complex as some on show, but still very appealing, was this Racing Seaplane with Rotary Engine by C. Summerfield of Twyford. Below, one of the best models in the current range of No. 10 Set leaflets, the Combine Harvester, well built here by C. Kensett of Chinnor, Bucks.

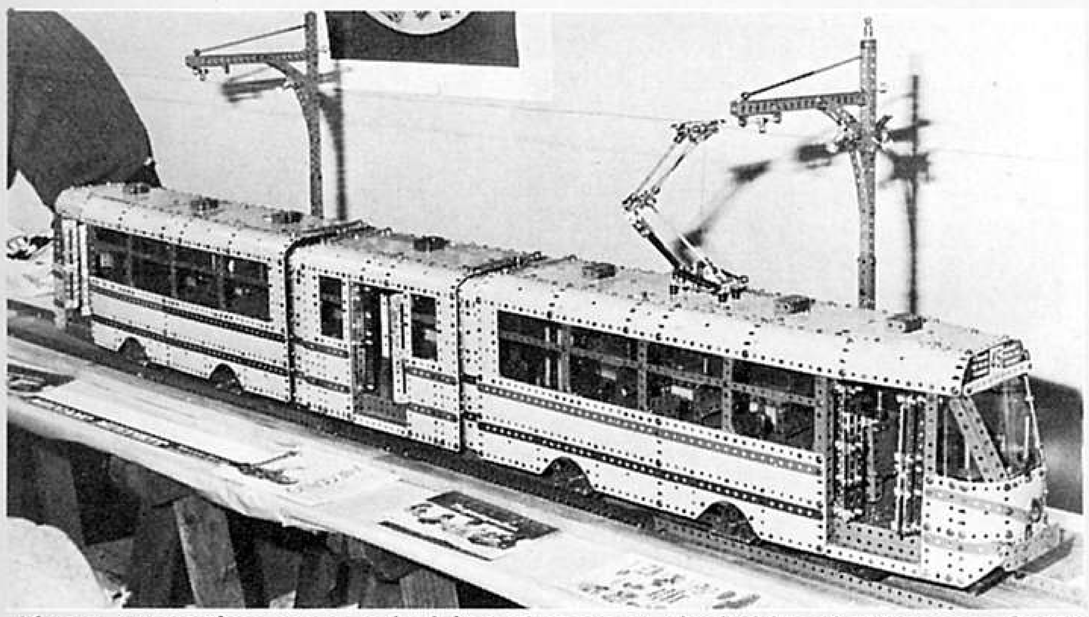




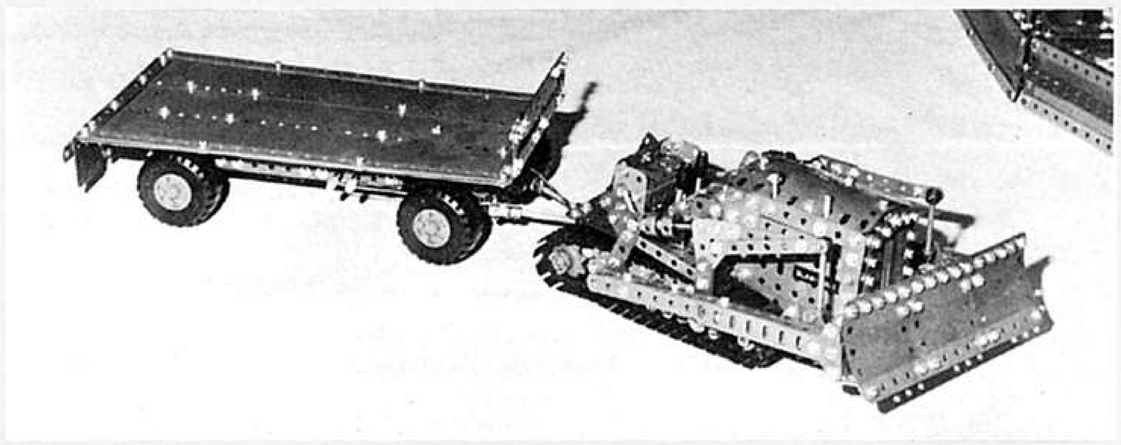


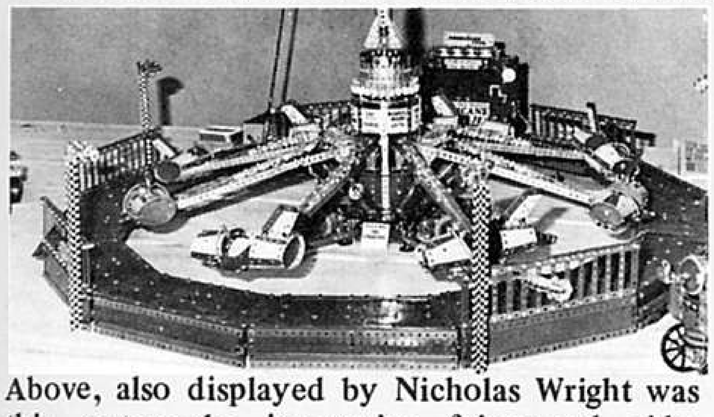
SHOW SCENE '77 STONELEIGH

A photo-report on the Midlands M.G. Display at the Town & Country Festival, Stoneleigh, 27–29th August

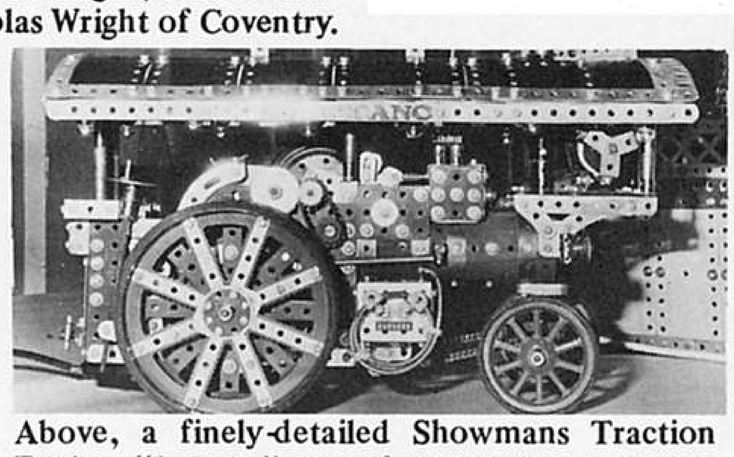


Above, attracting many admiring glances at the Midlands Meccano Guild Exhibition at the Town and Country Festival, Stoneleigh, was this Articulated Tram Car, based on an original type currently in operation in Brussels, Belgium, and built by Midlands M.G. President, Esmond Roden of Cheltenham, Gloucestershire. Powered by an E15R Electric Motor, it is fully operational and spent its time at the show rattling backwards and forwards along a length of demonstration track. Note the single-arm pantagraph used for picking up the electrical feed. Right, a neat Blaw Knox Bulldozer, with Flat Trailer, built by Nicholas Wright of Coventry.

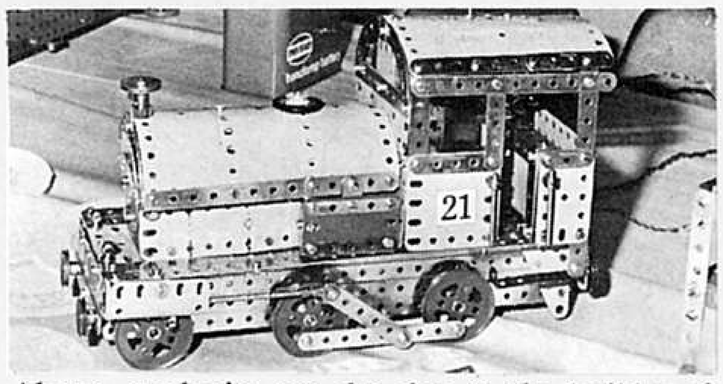




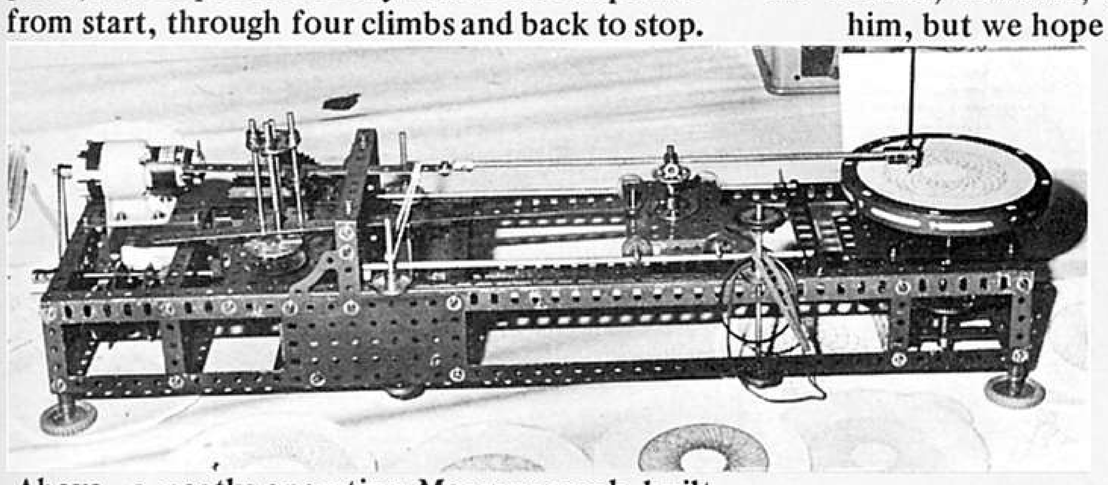
Above, also displayed by Nicholas Wright was this extremely impressive fairground ride, Hurricane Jets model. A superb exhibition piece, it incorporates a fully automated sequence from start, through four climbs and back to stop.



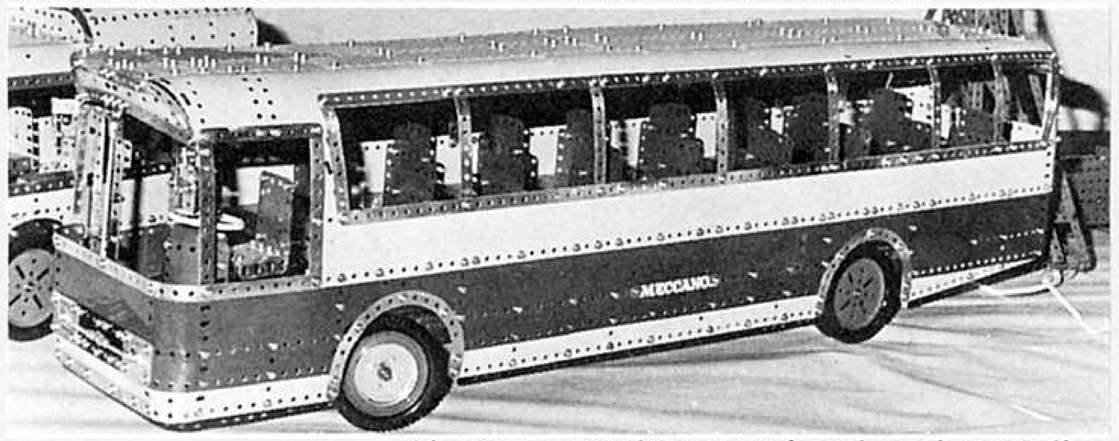
Above, a finely-detailed Showmans Traction Engine, "Success", one of several similar models on show at Stoneleigh. We must apologise to the builder, however, as we failed to identify him, but we hope he will contact us.



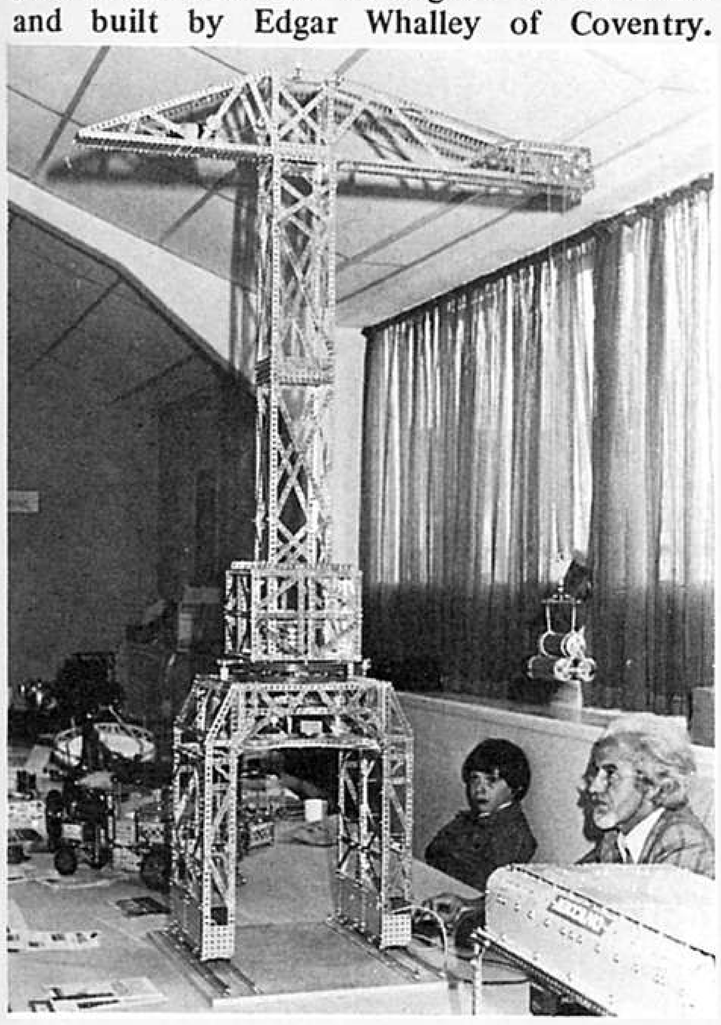
Above, apologies are also due to the builder of this neat little Tank Engine for we also failed to identify him. However, if he also contacts us, we will be pleased to rectify the situation in a future issue of the M.M.

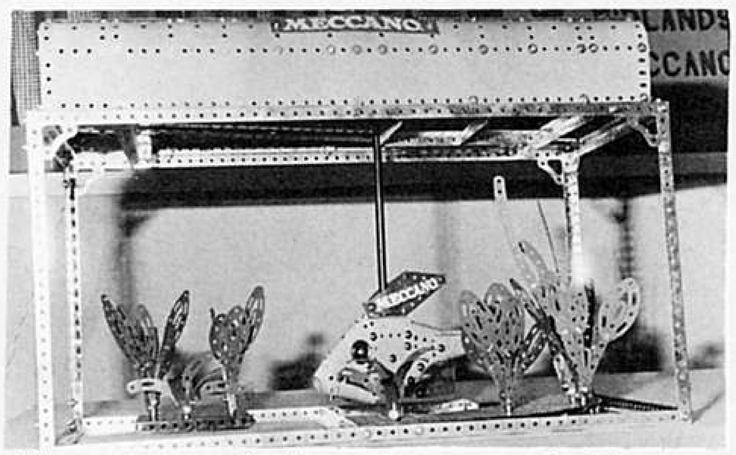


Above, a neatly-operating Meccanograph built by Midlands M.G. Secretary Ernest Chandler from instructions published in the May 1940 edition of Meccano Magazine. Below, towering high above visitors' heads was this Dutch Dock-yard Crane based on an original in Rotterdam and built by Edgar Whalley of Coventry.

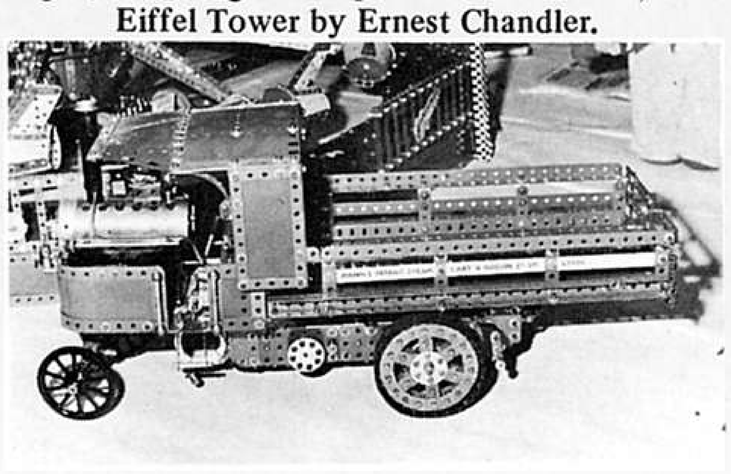


Above, a neatly-proportioned and appealing model of a Mercedes-Benz 0-310 Luxury Coach built to 1/10th scale by Roger Wallis of Solihull.





Above, one of the most unusual Meccano models we have ever seen: a Fish Tank complete with marine vegetation and moving fish! It was designed and built by Ian Sellick of Bristol University. Below, a Mann's Patent Steam Wagon powered by the Meccano Steam Engine and built by Ken Wright of Coventry. Right, towering centrepiece of the show, the Eiffel Tower by Ernest Chandler.



Design for Joy by PART 4 Andreas Konkoly

1965 was the 'Year of Meccano' in the Budapest television studios. As our first picture shows, I introduced the *Meccano Magazine*, a Maltese Cross Mechanism, and the Little Weather Prophet model [*MM* 1959 January] to young viewers. Later, I showed attractive Designing Machines.

These Meccano models caused great interest, and I received many letters from all parts of the country asking for the programme to be repeated.

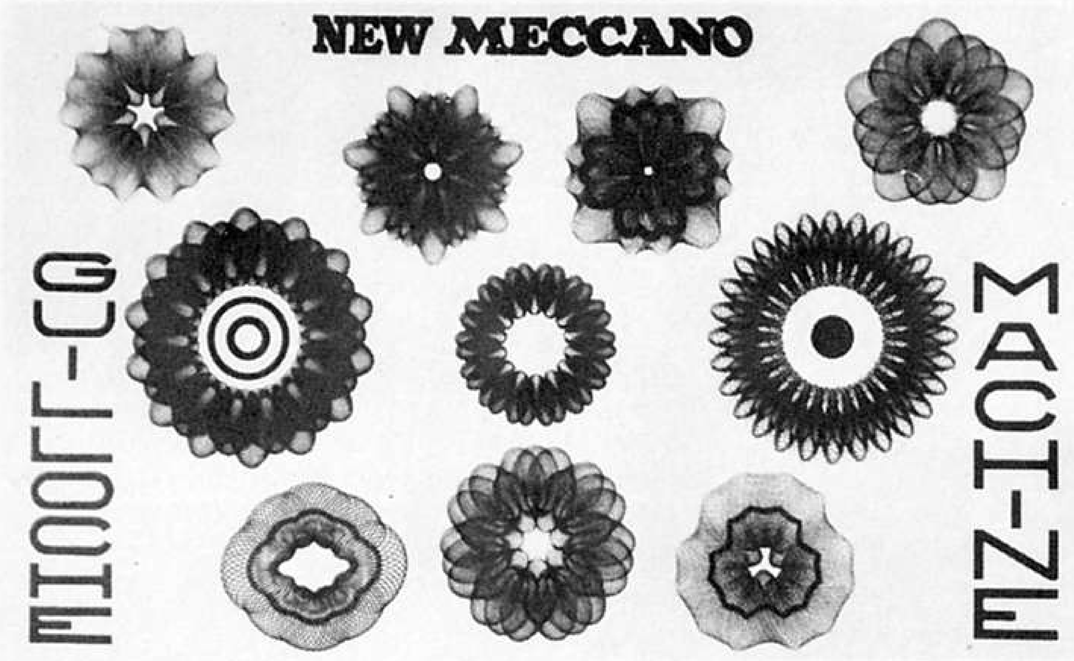
The year 1972 brought a revolution in the history of Meccanographs: this was the year in which I created the first

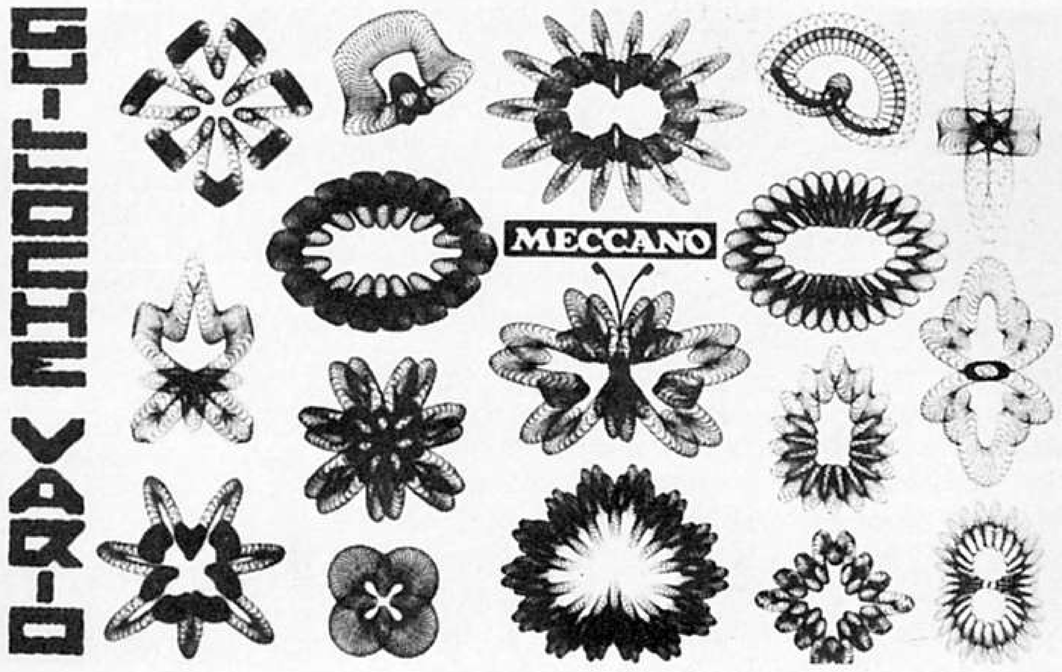
GUILLOCHE MACHINE,

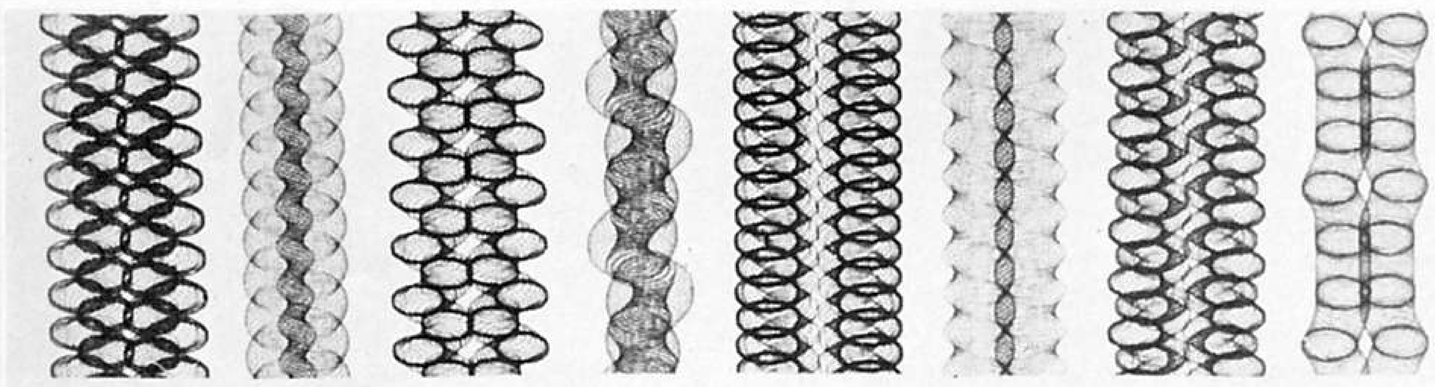
which was the result of two years' continuous experimenting, finally appearing in *MM* that year.

What is a 'Guilloche'? — Well, it's a pattern made by interlacing curved lines, a complicated rosette or similar type of pattern often used on banknotes and other bonds to provide a safeguard against forgery because of the difficulty involved in copying.

The machine produces complicated interwoven designs with symmetrical form on both inside and outside edges. Basically, the Guilloche rosettes consist of an eliptical form repeated about 4 000







times side-by-side. The machine contains compact mechanisms housed in a strong framework which hinges to allow easy access to the internal gearing.

Even though the Guilloche patterns were unique, I was not satisfied, so I developed the machine further and produced the

GUILLOCHE VARIO

This is the second member of the Guilloche family, and draws capricious designs on elipse, octagonal, rectangular, delta and deltoid, and trapesoid formats, as well as butterfly forms reminiscent of masks or bows.

I am sure that a Meccano engineer on first seeing the Guilloche designs would feel that the machine surpasses the capabilities of all other previous designing machines constructed with Meccano parts.

GUILLOCHE LONGIT

This variation on the Guilloche theme produces exclusively linear patterns. It has a strong base, stands on massive legs, and has a paper-holder and a console for ball-point pen refills. Just by the change

of some gears and segments we are able to produce longitudinal designs!

Although I did not forget the 'Guilloche family' — I later developed the theme even further — I next produced a machine whose mechanism had employed me for two years. It was the

'SHO-LEN' LINEGRAPH

'Sho-Len' is a word I coined from the phrase 'shortened — lengthened'. If we draw a short line forwards and backwards, followed by a shorter and then a shorter one still, then increase the length of lines gradually again, we can understand the principle of Linegraph: a line firstly minimized continually, then maximized continually. With this principle, the machine makes hundreds of beautiful op-art patterns in symmetrical and other forms. Full instructions for the 'Sho-Len' Linegraph are planned to appear in next October's *MM*.

I was curious to know what would happen if I drew not eliptical, but perfectly circular forms side-by-side with a Guilloche machine. The result was surprising, and a new development had been produced: the

GUILLOCHE CIRCUIT

Although this machine does not make such a variety of patterns as its fellows, the results of the different methods are indeed nice, and introduce contrasting designs to the Guilloche territory, which are capable of being built up quickly and easily.

To draw nice patterns side-by-side so as to be useable for embroidery was a big problem, but the Meccano

EMBROIDERY-GRAPH

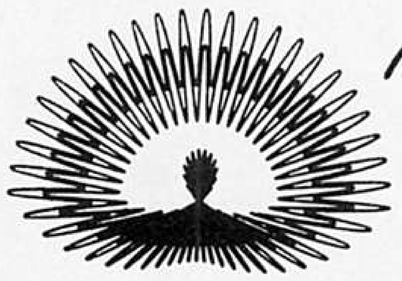
model solved this. It makes patterns suitable for lace, needlework, and pop-art table coverings. The machine has a built-in changing gearbox and openable top.

CONCLUSION

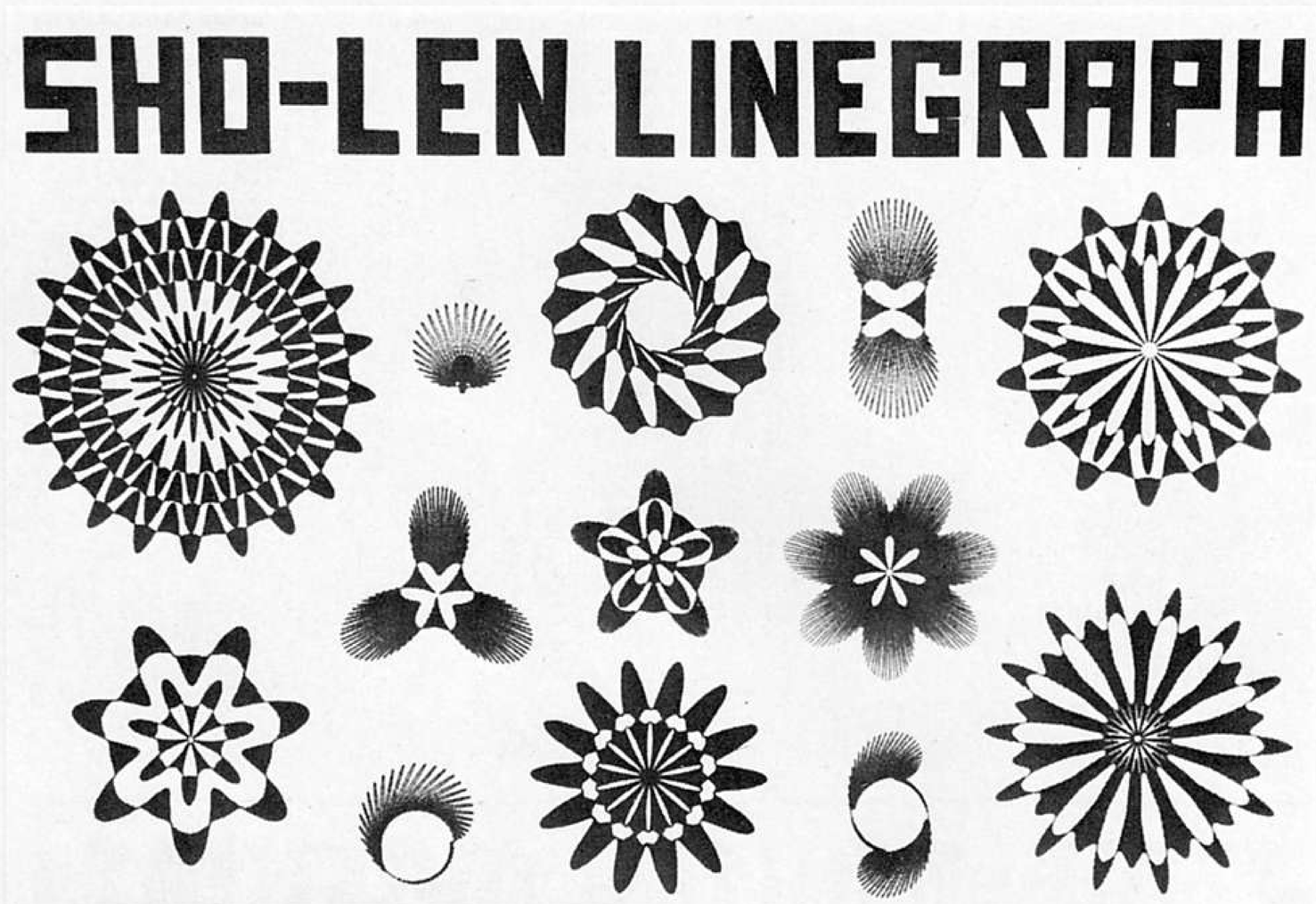
My Meccano Supermodel Series Nº 1 - 60 for Nº 10 Meccano Set contains still more interesting designing machines which I invented between 1973 and 1977. These are as follows: Meccano Lacegraph, Op-Art Graphic Picture Maker, T-Form Meccanograph, and 'Golillip' Guilloches Designing Machine. I would like to describe their work in the *Meccano Magazine* one day, but not everyone is interested in Meccanographs of course, and I am sure that the Editor has to remember this; but perhaps after publishing some of my other models — like the Steam Power Plant described in this issue — he will again allow me the pleasure of continuing the story of *Konkoly's Designing Machines, and the Most Amazing Patterns of them.*

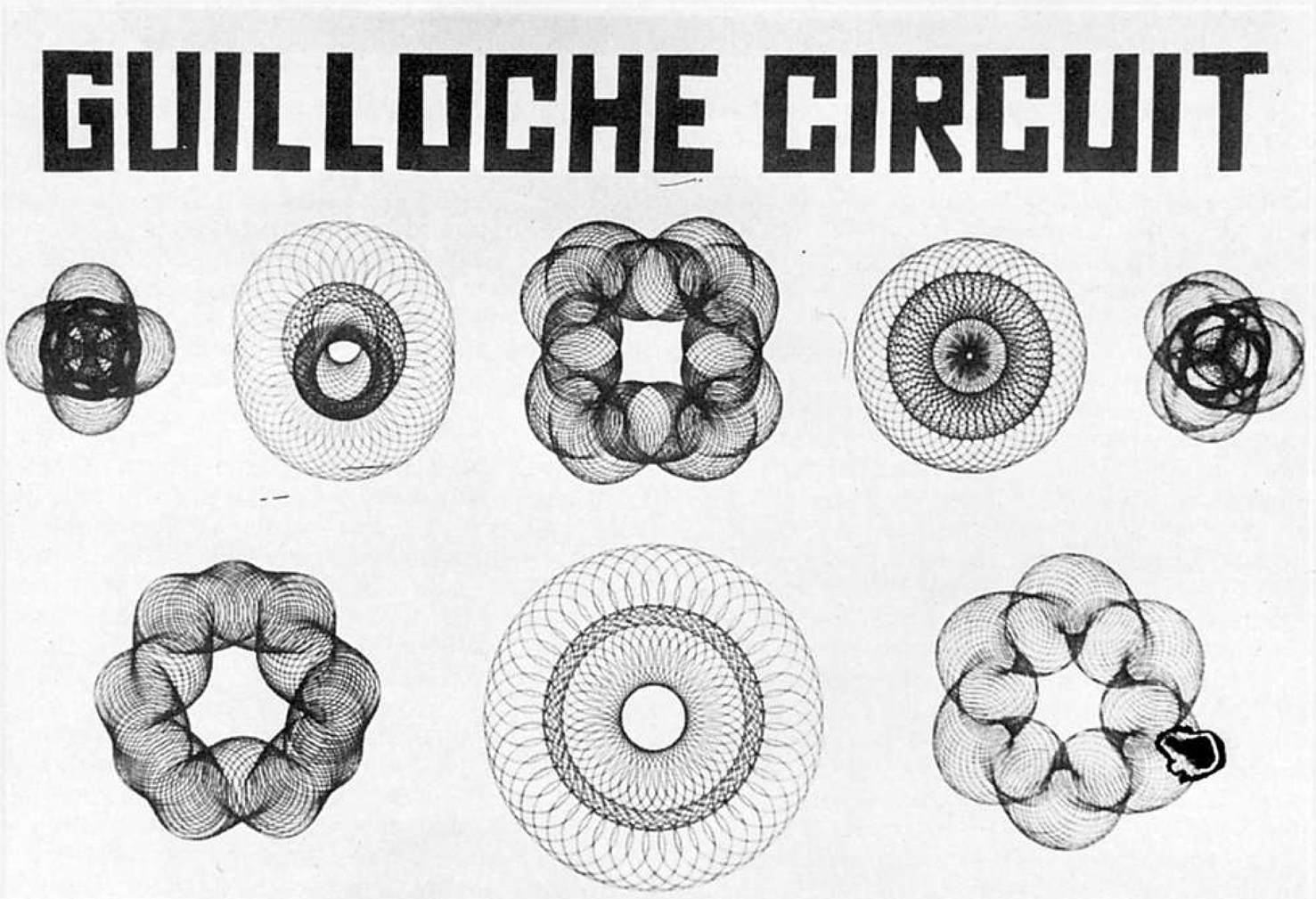
Your friend in Meccano,

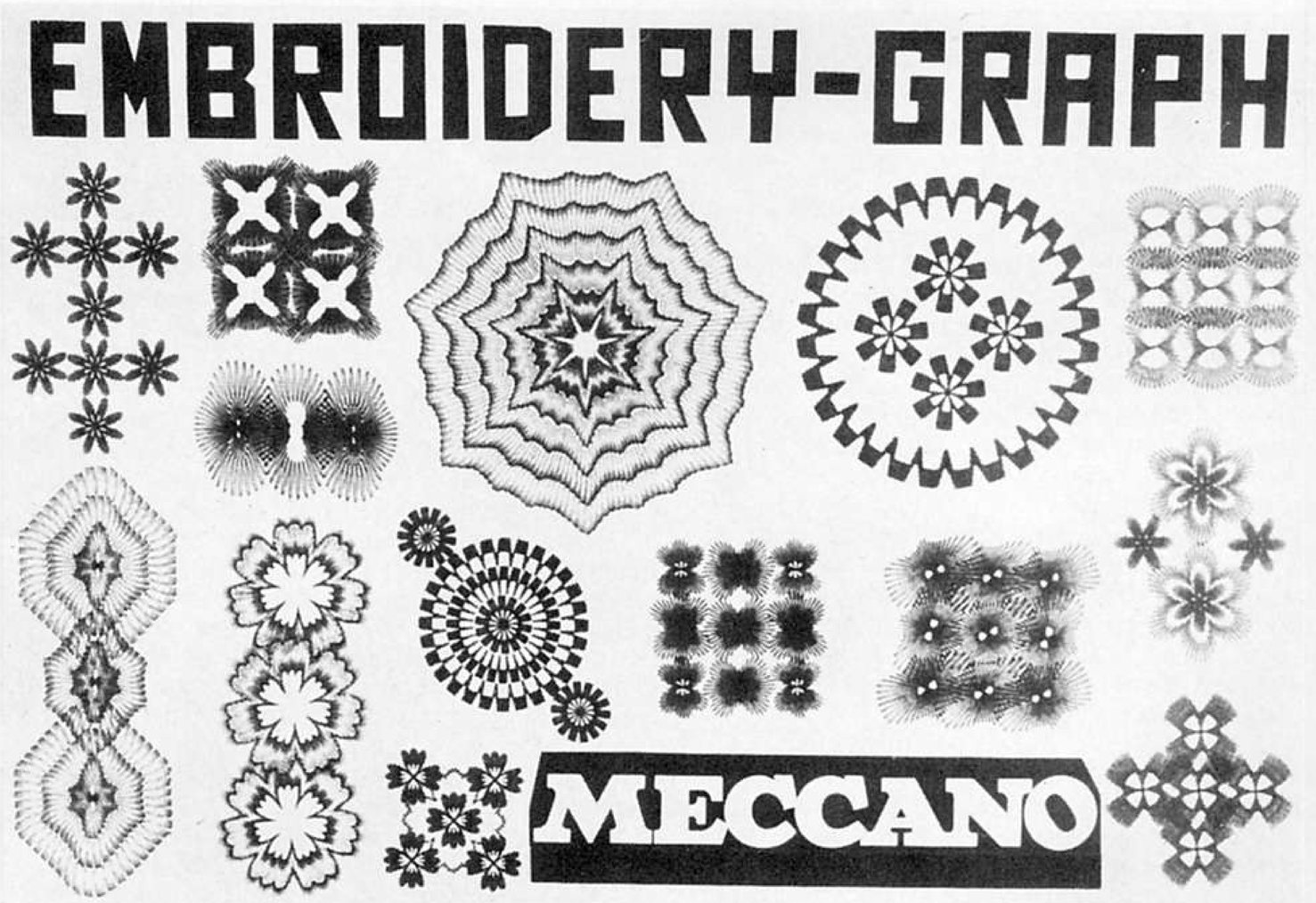
A. Konkoly

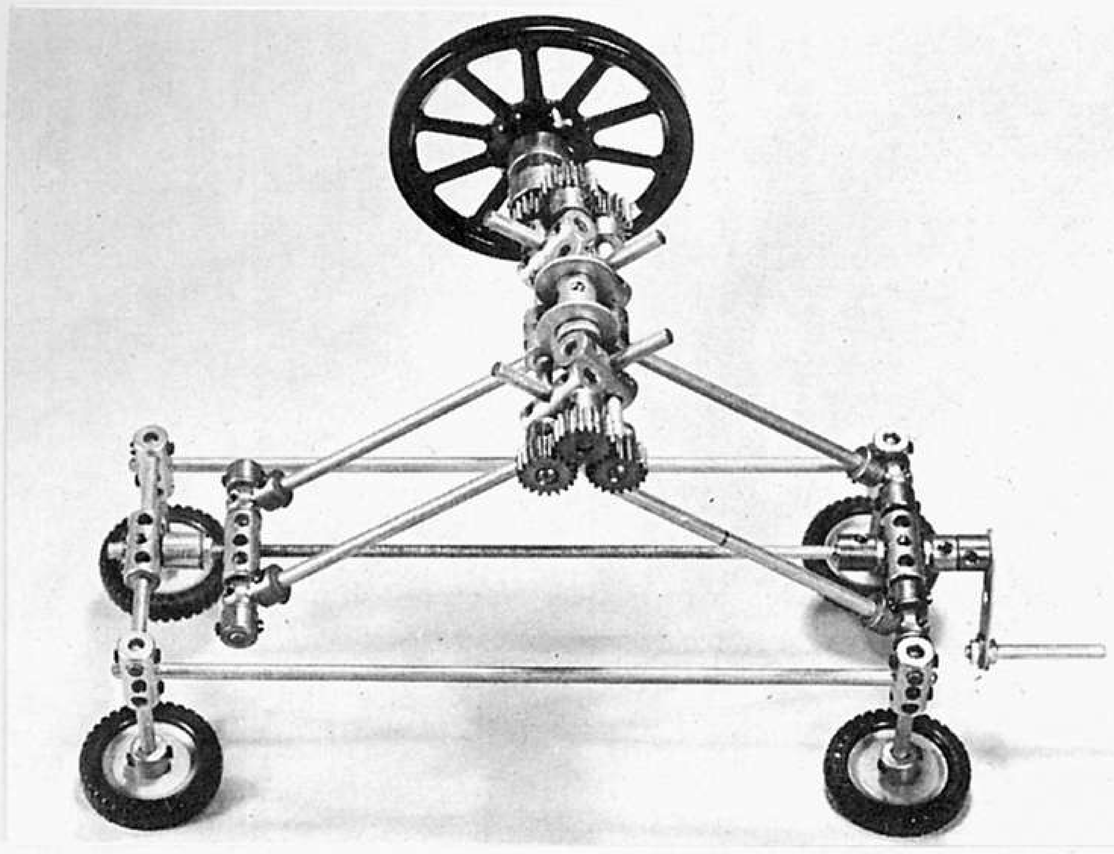


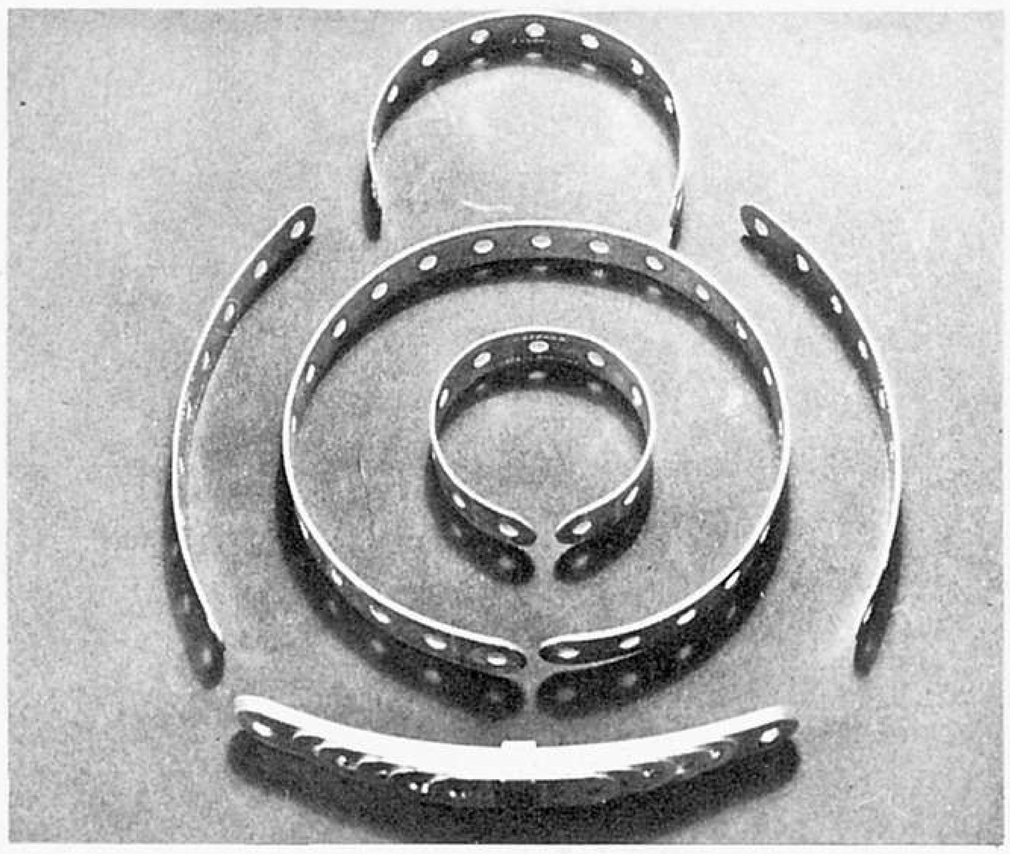
EDITOR's NOTE: I will be very happy to give space to the continuation of Andreas' story at a future date, as I feel that his development of the Meccanograph mechanism from a crude toy to an exact science is a very important facet in the history of Meccano. Andreas' other models are also a joy, and I hope that we shall be publishing many more in the years to come. In the meantime, readers wishing to purchase instructions for the machines mentioned in this series should contact Andreas direct [he is always glad to hear from fellow enthusiasts] at the address shown in his advertisement at the back of this issue. Ed











STRIP-ROLLING MACHINE

A practical unit designed by "MECCANOMAN"

In Meccano modelling, it is at times required to curve Strips to an even radius. When this is attempted by hand, uneven results stem from the tendency for the Strip to bend in a series of kinks at each hole. It is also very difficult to maintain the curve smoothly to the extreme ends of the Strip.

The Strip Rolling Machine described here has been designed to have its rollers mounted as close as practicable so as to ensure smooth curving of the Strip between its holes. The choice of ½" centres allows all three rollers to be driven together through a chain of ½" Pinions which ensure smooth passage of a Strip through the rollers with the minimum of slip; it will even be found that painted Strips can be curved to quite an extent with minimul damage to the paint. However, in all cases where sharp radii are required, the Strip concerned should be curved in a succession of operations of gradually increasing severity.

The machine is also equally efficient in straightening the Strips after they have fullfilled their function. In addition, mutilated Strips can very often be restored by curving them gently first one way and then the other, thus gradually reducing the damage until straightness is achieved once more.

CONSTRUCTION

THE ROLLERS

Construction is commenced with the top roller assembly which consists of a 3½" Rod with a centrally-mounted Short Coupling, on either side of which are placed, in order: a 3/4"Washer, a 3/8"Washer, two Couplings by their end transverse holes; then a further 3/8" Washer, and finally a ½"Pinion, boss inwards.

The lead-in roller assembly is formed of a further 3½"Rod which passes through the other end transverse bores of the inner pair of Couplings mentioned above. This also carries a centrally-mounted Short Coupling, and ½"Pinions, boss inwards on both ends.

The feed-out roller assembly is a 4" Rod, this time through the end transverse holes of the outer pair of Couplings, with a central Short Coupling as before. On one end is a ½"Pinion, boss inwards, with one spacing Washer. On the other end, the additional ½" length allows the relevant end ½"Pinion to be mounted boss outwards. The boss of this ½"Pinion is then inserted into one recess of a Socket Coupling, whose other recess carries the boss of a Spoked Wheel, which acts as actuating handwheel. *All* tapped holes in both Pinions and Short Couplings are fitted with Grub Screws, those in the Short Couplings must be 3mm [69c] to ensure an unobstructed rolling surface.

THE OPERATING LEVERS

The four operating levers are formed of 3½"Crank Handles, which must be carefully selected to be identical in length, and in the profile of their bends. The use of these Crank Handles ensures that a full range of roller positions can be achieved without fouling the 3½"Rods.

The lower ends of the outer Crank Handles are mounted in the bases of Handrail Couplings whose transverse bores rotate freely on 1½"Rods which form part of the base frame assembly. These Rods are connected by Couplings at their inner ends, and carry vertical Couplings at their outer ends to act as leg supports. Collars are fitted against the inner faces of the Handrail Couplings for location purposes.

THE BASE

The other end of the base frame assembly is similar, but carries no Handrail Couplings or Collars. The sides of the frame are 8"Rods located in the central tranverse bores of the vertical Couplings. The legs themselves are 1½"Axle Rods, which carry 1"Pulleys and Tyres as feet.

ADJUSTMENT

The setting of the roller angle is determined by a special assembly mounted on an 8"Screwed Rod, which consists of a Coupling mounted by its central transverse threaded bore. This has 1"Rods protruding from its ends which carry the eyes of two Handrail Couplings, which in turn are retained by Collars. These Handrail Couplings are of course mounted on the lower ends of the inner pair of Crank Handles. Turning of the 8" Screwed Rod thus allows a fine adjustment of the roller angles. This Threaded Rod carries a lock-nutted Adaptor for Screwed Rod whose pin turns freely in the central transverse bore of the horizontal Coupling at one end of the base.

At the other end of the base, the Screwed Rod itself turns in the equivalent bore of the Coupling at that end. The operating handle is a Threaded Crank fitted with a long Threaded Pin as shown, and is lock-nutted to the end of the Screwed Rod. Endplay is controlled to close limits with a Threaded Boss, which is also locknutted.

A few examples of work done by the machine are shown. It will be seen that various lengths of Strips can readily be rolled into complete circles. The laminated spring, produced with the aid of the machine, is interesting, as it seems to have acquired additional resilience in the process; it will return to the camber shown even after being deflected until 'flat'. In passing, I should mention that its buckle is a Short Circuit Piece [Electrical Part 554]; the various leaves are kept in alignment by a long Grub Screw through the centre holes of the leaves, which is retained in place by the buckle.

PARTS REQUIRED

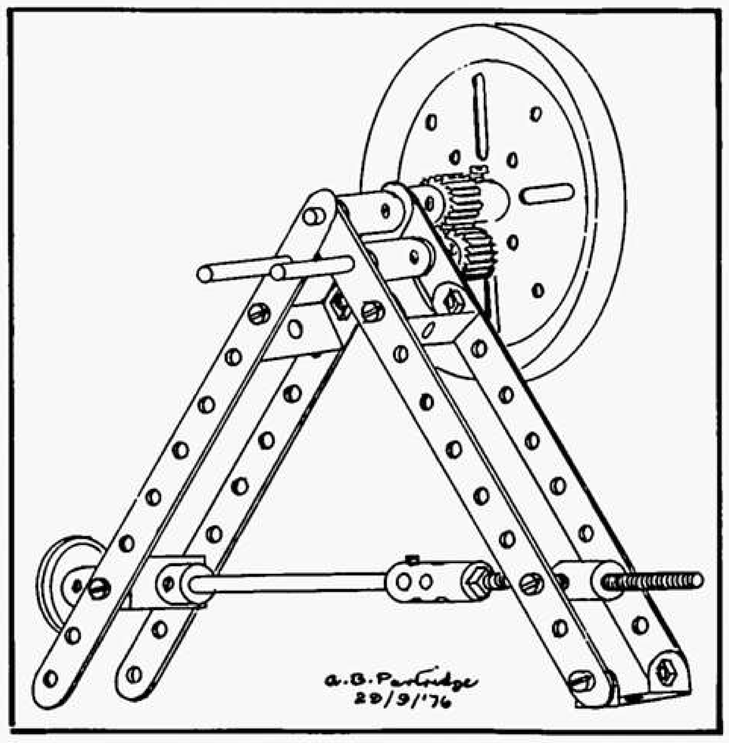
2 — 13a	6 — 26	1 — 64
1 — 15b	3 — 37c	1 — 69c
2 — 16	5 — 38	1 — 79
8 — 18a	2 — 38d	1 — 115a
2 — 18b	4 — 59	4 — 136a
1 — 19a	1 — 62a	4 — 142c
4 — 19s	11 — 63	1 — 171
4 — 22	3 — 63d	1 — 173a

AN 'ECONOMY VERSION'

by ALAN PARTRIDGE

This device is closely based on the foregoing machine which I have found so useful. My version contains the minimum of expensive brass parts, but is not so robust as 'Meccanoman"s.

The construction should be clear from the diagram after reading the description of the 'Rolls-Royce' version.



In View

THE GREYFRIARS BOOKS

Published by HOWARD BAKER PRESS

It has been said that nostalgia isn't what it used to be(!), but this is surely untrue of the time in which we live — a strange period where many people are hankering for the art forms [and by that I mean the everyday utilitarian art forms like the Oxo tin and the 'candlestick' telephone] that they knew many years ago. Indeed, many feel a 'nostalgia' for the times before they were born, and enjoy experiencing the pleasures of other peoples' past.

Lovers of past literary pleasures are fortunate in having publishers who are equally enthusiastic in their willingness to republish facsimilies of former glories. The Meccano fraternity is well provided in this respect, but other sections of our nostalgic society are equally well-served, not the least of which are the lovers of the pre-war-style boys' magazines.

It was nearly 70 years ago that William George (Billy) Bunter first 'Yaroooop'ed' his way into the schoolboy scene at 'Greyfriars School', care of the pages of *The Magnet* and author Charles Hamilton, alias Frank Richards. The paper shortage of the second world war killed *The Magnet* in 1940. Others of that ilk shortly to go the same way were *The Gem* and the *Schoolboys' Own Library*. Bunter and Co (somewhat distorted) lived on in post-war comics, but they were never the same, much to the regret of the early fans.

However, all is now put to rights by Harold Baker, a 51-years-old Anglo-Irish-man who was editor of the *Sexton Blake Library* publications of the 1950s. Later, as a publisher in his own right, Mr Baker scoured the vaults of the original owners of the Greyfriars copyright and found a Bunter story that was only partly published previously, reprinted the whole of each comic in which the episodes appeared, added a hard cover and released the book on an unsuspecting world.

So enthusiastically was the book received, that it has been followed by other facsimile omnibus editions of *The Magnet* and other similar magazines *at the rate of one a month for the past nine years.*

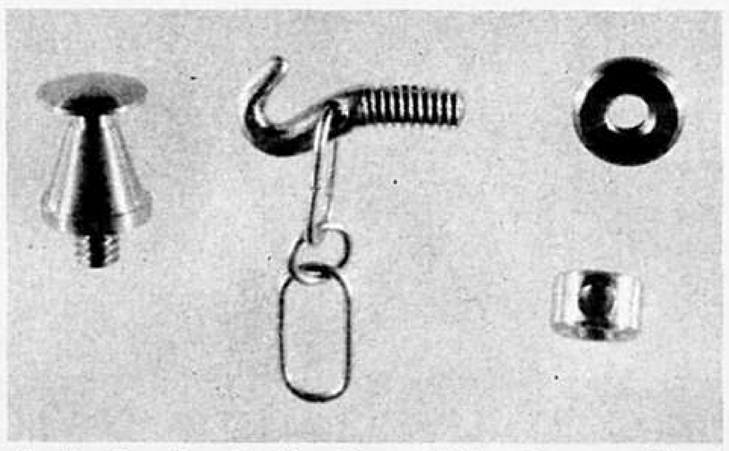
The books are excellently presented, and the reproductions (including the 2-colour covers of each magazine) are very fine indeed. A great deal of care has obviously been taken with what is plainly a labour of love on the part of Mr Baker, and enthusiasts (old and new) for this kind of literature should be well pleased.

What brought the books to my attention, and their subsequent review here is the fact that the comics reproduced sometimes carry Meccano/Hornby and/or Erector advertisements. In the copy supplied for review (*Crime at Christmas* [Sexton Blake stories from *Union Jack*]), there are no less than three half pages of Meccano, and three more half pages of Hornby Trains, and a page of Erector.

The books in the Greyfriars Press series are of great interest, and if you buy them for the nostalgic advertisements, beware, the stories are contagious, you may end up a committed fan! Mike Nicholls

Complete, illustrated catalogue available from: Howard Baker Press Ltd, 27a Arterberry Road, Wimbledon, London, SW 20, England.

NEW REPLICA PARTS



Left: Replica Buffer Part 120. Centre: Mk 2 Train Coupling. Top Right: Threaded Shoulder for Train Coupling. Bottom Right: Narrow Aeroplane Collar.

NEW REPLICA PARTS

Part P52 Aeroplane Collar (narrow)

In addition to the version of this part announced in this column in our April edition, the Wellingborough and District Meccano Club now offer an even narrower type.

Replicating the dimensions of what must certainly have been the smallest Collar ever produced by Meccano for the standard Meccano Axle, the new reproduction measures 8mm in diameter by 5mm in width. Meccano produced two versions of this part, one tapped 6BA, the other tapped with the standard Meccano 5/32"BSW thread. W&DMC have sensibly chosen the latter so that our Grub Screws will fit it. It is interesting to note that the whole Collar is very little wider than a Grub Screw!

An extremely useful part for tight corners — beautifully produced in brass with champhered edges — highly recommended.

Part 120 Buffer

Our second introduction from this source is a splended replica of the Meccano Buffer, turned from solid brass.

As regular readers of this column would expect, W&DMC have reproduced the original Meccano measurements exactly, the part measuring 9.5mm in diameter, by 17mm overall.

Ideal for 0-gauge models, and a good many more uses one suspects — highly recommended.

Part 121 Train Coupling (type 2)

It is a pleasure to introduce another excellently-reproduced brass part from the Wellingborough & District MC. This time it is the second design of Train Coupling originally marketed by Meccano Ltd from 1922 to 1925.

Although primarily intended for use on 0-gauge train models, the hook could find many other uses. The shoulder is a separate threaded disc that seems to offer endless possibilities in its own right. I can think of many uses for a 'threaded Washer', perhaps W&DMC could be persuaded to sell this component separately (numbered 121a or 38t)?

A beautiful reproduction that is highly recommended. Mike Nicholls

Prices: P52 narrow 13p; 120 50p; 121(2) 65p. Available ONLY from: M J Burgess, Wellingborough & District Meccano Club, 56 Park Rd, kettering, Northants, NN16 9LL, England.

THE HORNBY COMPANION Volume 1

THE PRODUCTS OF BINNS ROAD - A GENERAL SURVEY

By Peter Randall

Published by NEW CAVENDISH BOOKS

£12.50

This is one of the books for which the enthusiasts have been waiting. It is, in fact, the first of the *Hornby Companion Series* planned to emerge from New Cavendish Books over the next year or two and is, in most respects, up to their usual standard of excellence.

That it is directed at the enthusiast must be evident from the title, because you have to be on the inside of the game to know what 'Binns Road' means. I hope that this slightly obscure point will not deter a wide readership, because everybody has heard of Meccano Ltd, and this book is very well written and ought to have a wide appeal.

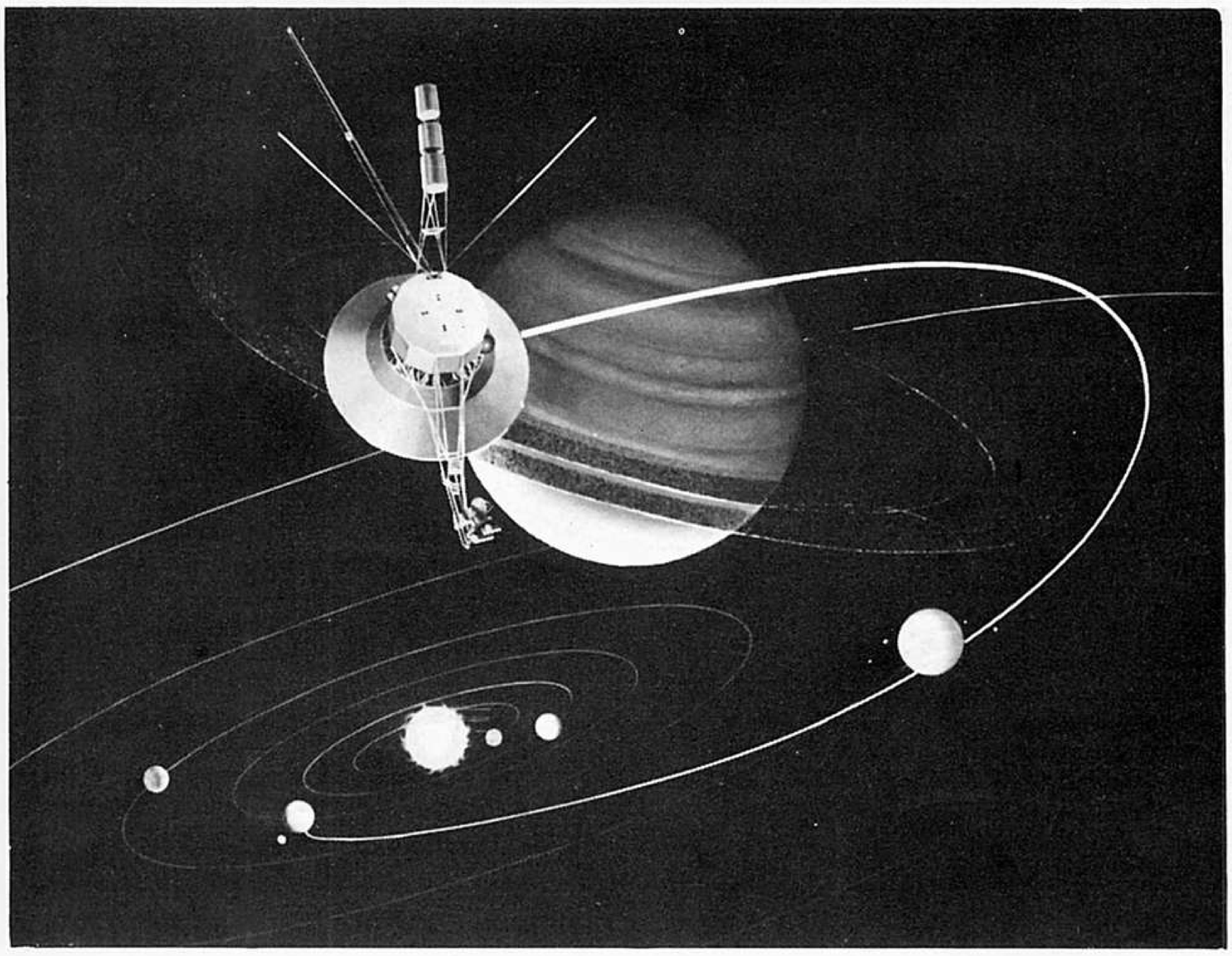
Two things, in particular, about the text give me great satisfaction — the author has managed somehow to mention *everything*, either by direct reference, or by allusion to a group of related products; for example, he doesn't directly describe the Hornby Countryside Sections, but he does mention "tunnels, cuttings, and fields"; and, thank goodnes, here we have a book which is *accurate*, which is more than one can say of many allegedly authoritative works.

But if the enthusiast is likely to be the typical purchaser of the book, it is precisely he who will find very little new in it by way of information; so what is the attraction beyond a highly readable survey? It is, of course, the illustrations, especially the beautiful colour sections — reproduced with great care from cherished originals — of a 1934 — 35 Meccano Products Catalogue and a 1938 — 39 *Hornby Book of Trains*, together with a sub-section dealing with pre-war Dublo, and post-war Hornby. These are reproduced complete, page for page, with all their glamour, including the covers; and very nostalgic they are too.

Certainly the colour pages dealing with the early Blue/gold period jerk me straight back to a carefree world which I thought I had left a long time ago! On a more prosaic level, you might think that this is what you are really buying for your £12.50.

I also have to admit to myself — perhaps a little ungratefully — that I do not find the physical balance between the text pages, printed on heavily grained cream laid paper, and the full-colour sections on glossy art paper, an entirely happy one in terms of book production. Nor do the very extensive half-tone illustrations in the text always appear to best advantage (your reviewer writes with great feeling here because he happens, through a rather devious route, to be the originator of the Blue/gold model on p17). I think this fault probably arises from the use of pictures culled from other printed sources — even though those sources are, as they say, impeccable.

But it is a splendid book; you are sure to want a copy; and it promises very well for the rest of the series. Alf Reeve.



ALL ABOARD FOR A GRAND TOUR OF THE SOLAR SYSTEM!

says Mike Nicholls

In late August and early September last year, the National Aeronautics and Space Administration launched two Voyager spacecraft.

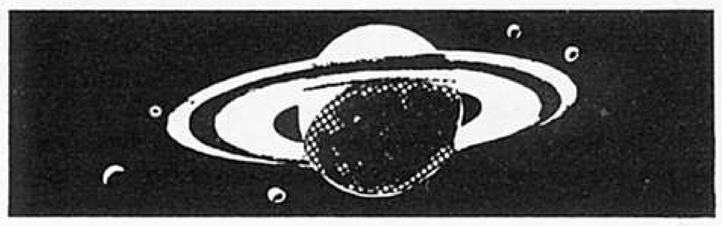
Riding atop a Titan Centaur rocket, the Voyagers were launched from Kennedy Space Center, Florida on a decade-long odyssey that could take them to as many as 15 major heavenly bodies, including giant Jupiter and ringed Saturn and several moons of both planets: probably Uranus and possibly Neptune.

The information returned by the spacecraft is expected to shed a new light on the origin and early history of the solar system and our own planet, Earth.

VOYAGER – NEXT STEP TO SPACE

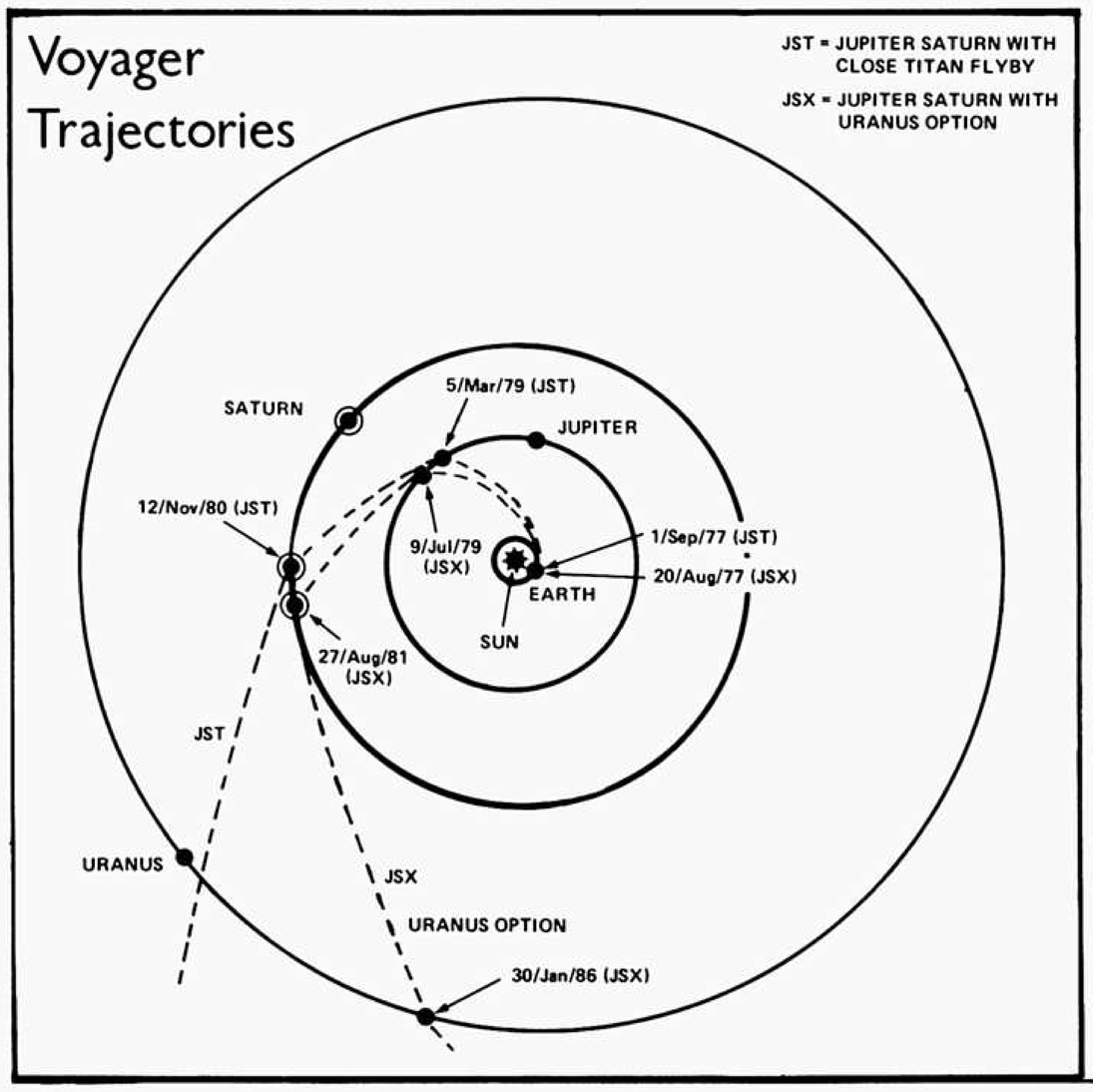
NASA has already sent spacecraft to Venus, Mercury, Jupiter and Mars. Project Voyager is the next step in the United States program of systematic planetary exploration in which the solar system is used as a natural laboratory.

The outer region of the solar system is considered the source of much important data about the Sun and its planets. The inner planets — Mercury, Venus, Earth and Mars — have gone through considerable evolution in the last four to five thousand million years; today we witness at their surfaces and in their atmospheres the end result of long evolutionary processes. But in the case of the outer planets and their moons — mainly because of the low temperature that prevailed in the past of the solar system — we can still find objects where evolution has been so slow that today conditions are not so very different from those at the time of formation. By exploring the outer planets, we can go back in time, and sample the conditions in which the Sun and the planets are believed to have condensed.

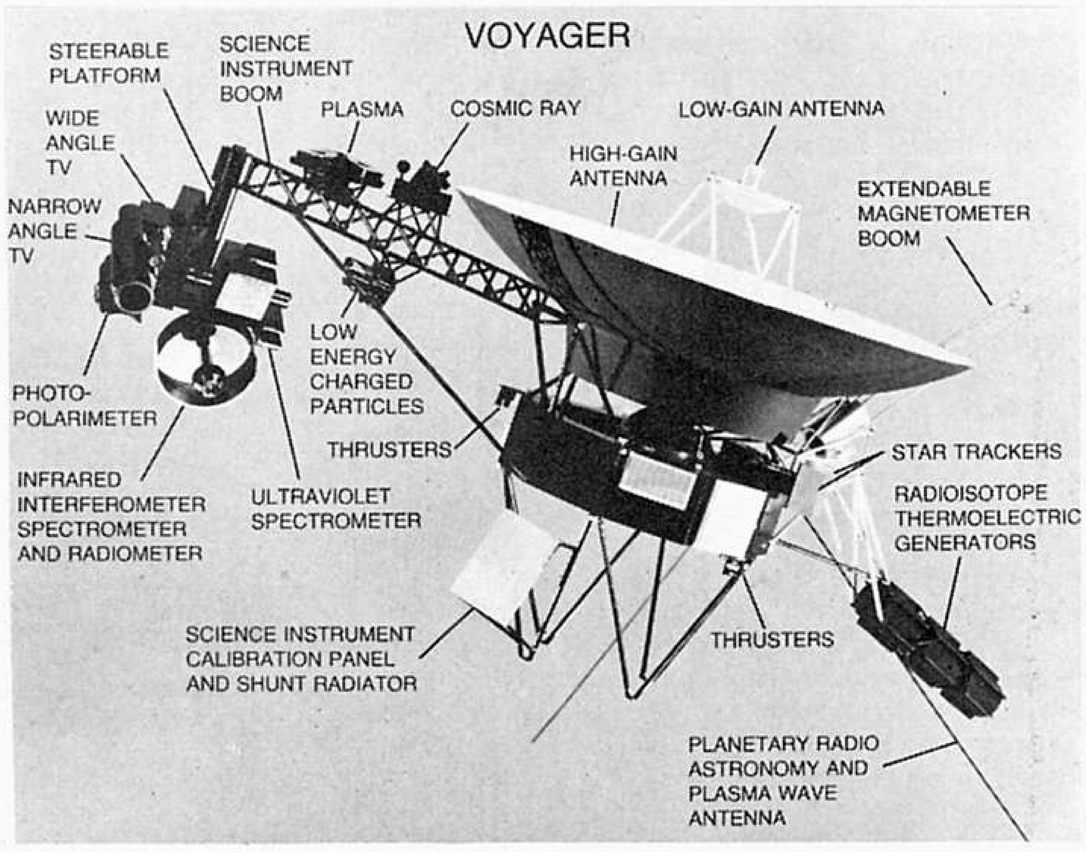


OUTER PLANETS HAVE MANY SATELLITES

Jupiter and Saturn, drastically different from the 'terrestial' planets, appear to be composed primarily of hydrogen and helium. Jupiter is larger than all the other planets in the solar system *combined*. Jupiter has 13 or 14 known satellites (the recently discoved 14th has not yet been confirmed), and orbits the Sun at a distance more than five times greater than Earth's orbit. One Jovian year equals



FACTS & PICTURES SUPPLIED BY THE NATIONAL AERONAUTICS & SPACE ADMINISTRATION



about 12 Earth years, and Jupiter's day is about 10 hours long.

Saturn orbits the Sun almost 10 times as far away as Earth, completing one orbit every 30 Earth years. A day on Saturn is also about 10 hours long. Telescopic observations of Saturn's rings are dazzling. The widest visible ring has an outer radius of 137 000 kilometers. Saturn has more than 10 satellites, including the largest, Titan which has an atmospheric density comparable to that of Earth.

TRAJECTORIES AND SPEEDS DIFFER

Plans call for the first launched Voyager to fly a slower trajectory, allowing the second spacecraft — launched about 12 days later — to overtake it and reach Jupiter about four months earlier. Jupiter's gravity will slingshot the Voyagers towards the ringed planet Saturn, with the two spacecraft reaching Saturn about nine months apart.

Photography of Jupiter will begin in December 1978, 80 days before the first Voyager reaches the planet. At that time, images of the brightly banded planet will already exceed the resolution of Earth-based photographs. For about two months, photography will be continued with the spacecraft's narrow-angle camera, which has a 1 500mm focal-length lens. In late February, eight days from Jupiter, Voyager will begin coverage of the entire planet with its wide-angled camera (200 mm focal length), while the narrow-angle instrument provides high-resolution photography of selected features of Jupiter's clouds. At the same time, the infrared and ultraviolet spectrometers, and the photopolarimeter will be obtaining data on atmospheric composition, temperature variation in the atmosphere, and aerosols in the clouds.

CLOSE LOOK AT JUPITER'S MOONS

Shortly before closest approach to Jupiter — March 1979 — Voyager 1 will fly about 415 000 km from Amalthea, giving scientists their first close look at the innermost of Jupiter's satellites. Closest approach to Jupiter will be 3.9 radii (R_J) from the surface of the planet (about 280 000 km). Jupiter will occult the Sun and Earth, as seen by instruments on the spacecraft, allowing scientists to make precise measurements of the structure and composition of its atmosphere.

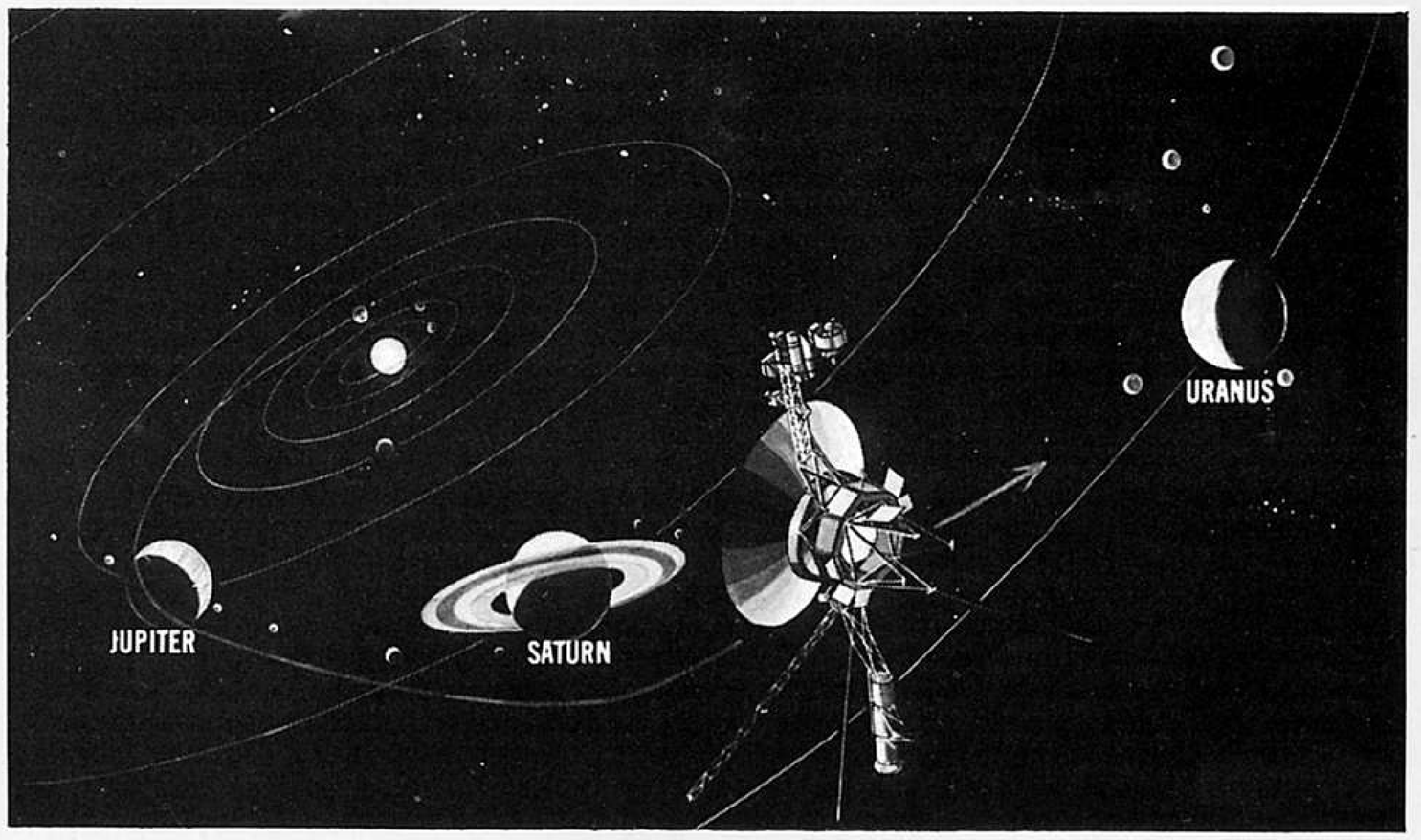
After passing Jupiter, the first Voyager will examine all four of the big 'Galilean' satellites: Io from 22 000 km, Europa from 733 000 km and Ganymede and Callisto from about 120 000 km. Observations of Jupiter will continue for about a month after closest approach, until early April 1979.

The second Voyager will begin its observatory phase about two weeks later, again 80 days before closest approach. It will observe four satellites during the inbound leg: Callisto from 220 000 km, Ganymede from 55 000 km, Europa from 201 000 km and Amalthea from 550 000 km.

ENCOUNTERS SCHEDULED

Closest approach to Jupiter will occur 1979 July 10. The spacecraft, following a more distant path than its predecessor, will pass 643 000 km from the center of the planet. The Jupiter encounter period will continue into August.

The first Saturn encounter will begin in August 1980 and will continue through December. On the inbound leg, Voyager will pass within 4 000 km of the surface of the major satellite Titan. During the encounter it will also scan the satellites Tethys, Mimas, Enccladus, Dione, and Rhea as well as closely observing the rings of Saturn. Closest approach to Saturn — 209 300 km — will occur 1980 November



12. Titan, Saturn and the rings will occult the Sun and the Earth as seen by instruments on the spacecraft.

The second Saturn encounter will begin in June 1981. Closest approach to Saturn will occur 1981 August 27. The spacecraft will also observe six satellites and Saturn's rings. Encounter will continue throughout September 1981.

The Voyager spacecraft each weigh 810 kilograms, the scientific instruments weighing a total of 105 kg for each spacecraft. The new Voyager spacecraft differ from past planetary Mariner spacecraft, due primarily to the environment into which they will venture and the great distance across which they must communicate with Earth. Since the outer planets receive only a small fraction of the sunlight that strikes Earth and Mars, the Voyagers cannot depend on solar energy, but must use nuclear power — radioisotope thermoelectric generators. Another obvious difference is the large antenna: the antenna on the Voyager spacecraft is 3.7 meters in diameter.

ONBOARD INSTRUMENTS LISTED

Each Voyager will use 10 instruments and the spacecraft radio to study the planets, their satellites, the rings of Saturn, the magnetospheres surrounding the planets, and interplanetary space.

In addition to wide-angle and narrow-angle television cameras, the Voyagers will carry cosmic-ray detectors, infrared spectrometers and radiometers, low-energy charged-particle detectors, magnetometers, photopolarimeters, planetary radio astronomy instruments, plasma and plasma wave experiments and ultraviolet spectrometers.

The television cameras are expected to provide scientists with the best pictures of Jupiter and Saturn ever obtained and the first high-resolution close-up images of the Galilean satellites of Jupiter, the major satellites of Saturn, and Saturn's rings.

Other instruments will probe the atmospheres of the planets and satellites, their magnetospheres, and the interactions between these regions and the solar wind, and radio bursts from Jupiter (which emits the strongest radio noise in our sky except the Sun). Other objectives include occultation of Earth and Sun by the planets, Saturn's rings and Titan, all-sky surveys of interplanetary space, and location and definition of the heliosphere or boundary of the solar wind.

TRAJECTORIES CHOSEN WITH CARE

Trajectories were carefully chosen to provide good scientific information not only about the planets, but also about their satellites.

Io, Europa, Ganymede and Callisto — Jupiter's Galilean satellites — and Titan qualify as objects for close study in their own right. They range from larger than the planet Mercury down to the size of Earth's Moon; Titan is the only satellite in the solar system known to have an appreciable atmosphere.

The Voyager trajectories make use of the favourable outer planet alignment identified during proposed Grand Tour mission studies to achieve flybys of both Jupiter and Saturn. The most favourable opportunity for a close approach to Jupiter with relatively short flight times to Saturn (less than four years) is the 1977 launch window.

The mission also builds on information gathered about Jupiter by the Pioneer 10 and 11 spacecraft — partcularly about Jupiter's magnetosphere.

URANUS FLYBY OPTIONAL

NASA officials have an option to send the second Voyager spacecraft on to the planet Uranus, with encounter occuring in January 1986. The Uranus option will be exercised only if primary Saturn science objectives have been met by the first spacecraft and the operating health of the second warrants such an undertaking. There is also a possibility — because of the alignment of the outer planets — that the second spacecraft could be targeted to continue on to Neptune after its encounter with Saturn.

Both spacecraft will eventually escape from the solar system after they have completed their encounters with the giant sister planets. They will be tracked by radio from Earth as long as possible to obtain science data on the heliosphere, particularly to study interactions between solar and cosmic radiation.

TRACKING FACILITIES

After launch, tracking and data acquisition will be performed by the Deep Space Network with stations in California, Australia and Spain. At planet encounter, high rate data will be received through the DSN's 64-m antenna subnet. Maximum data rate at Jupiter is 115 000 bits per second; at Saturn it is 44 000.

The Voyager program will be managed by NASA's Office of Space Science, Washington, DC. Project management responsibility has been assigned to the Jet Propulsion Laboratory, Pasedena, California, which is managed for NASA by the California Institute of Technology. JPL designed, developed and built the two spacecraft.

Meccano Magazine will be keeping in close contact with the Voyager missions, and we will be publishing facts and photographs as they come in.

MECCANO CLUB ROUNDUP

All Meccano Clubs are invited to submit reports for these pages. Report should be approx. 350–400 words long and should reach us by the end of the second month before the month of publication.

GUISBOROUGH MECCANO CLUB

The G.M.C. held a Jumble Sale on 2nd November to raise funds, but I regret to report that this was not as good as it might have been owing to power cuts. However, we raised £30 which will certainly help.

We visited the North Eastern Meccano Club's exhibition at Darlington on Saturday, 19th November and were very impressed by the standard of the models on show – way above our own, I'm afraid! I run a "points" system for the models built in our Club. Each model is judged out of 10; every deviation from the model illustrated in the Model Book or other mistake counts as one point off. Also, bad behaviour, swearing, etc. is penalised by losing points and at the end of the month 30p is awarded for first prize and 20p for second prize.

At the time of writing, we will shortly be playing one of the local Junior Schools at chess, this being one of the side activities we do on games night.

The Club was a year old in October and we celebrated by a hike upon Roseberry Topping, our local hill, or mountain. It is only 1,051 feet high, but it is quite a stiff climb for a broken-winded fellow like me!

We have a full attendance at each meeting and a waiting list, so Meccano is certainly not dead in this area. Anyone interested in joining the Guisborough Meccano Club should contact the Leader:

W. A. ING,
5 Scarteen Close
Guisborough, Cleveland

HOLY TRINITY MECCANO CLUB

The 21st meeting of the H.T.M.C. was held at Hildenborough on 22nd October 1977.

At 2.00 p.m., in the absence of the Chairman, the President, Tony Homden, welcomed members and specifically, prospective members, Jonathan Wolfe from Haversham and Daniel Senior. A free roam of models until 3.00 p.m. was the order of the day, with members labelling those models to be entered for the Stuart Wilson Cup Competition, so that judging could take place later.

The Annual General Meeting began at 3.00 p.m., with Tony Homden presiding. After apologies for absence and a tribute to the late Eric Jenkins, the Secretary gave his report, which, among other things, included mention of members' attendance at the Henley Exhibition and the Solent Club's Exhibition at Waterlooville, Portsmouth, as well as Bill Roberts and family's trip to the Meccano Exhibition in Nancy, France. Bill's report on the visit has been distributed separately to members. Members also exhibited models at the M.M.G's display at Stoneleigh, although this in their capacity as joint members of the M.M.G.

Following the Treasurer's report, which highlighted the fact that expenditure exceeded income, the Secretary moved that the subscription to the Club should be increased to £2 for adults. The meeting agreed to this proposal without dissent. Election of Officers then took place with the President, Tony Homden, and Secretary/Treasurer, Frank Palin, being returned unapposed. The post of Chairman, however, vacated by Michael Martin for domestic and health reasons, was filled by Eric Schoolar. With Michael also unable to continue his duties as Scribe, James Dowswell volunteered to try his hand (literally!) and the members were only too happy to elect him to the post. 1978 meetings were set for April 29th and October 28th and the formal part of the meeting closed at 4.30 p.m. Then followed refreshments, during which Stuart Wilson Cup votes were counted. The winner turned out to be Bob Ford with his hefty (75 lb) Lorry-mounted Crane and, amid loud applause, the Cup was presented to him by Tony Homden.

With the business side of the meeting completed, attention focused on models, of which there were many in evidence. Unfortunately, space does not allow a description of the models to be given here, but all members did at least receive a description – ably written by James Dowswell – with their copy of the last Club Report. By 6.45 p.m. the meeting had closed and members were on their way home.

FRANK PALIN, Secretary
22 Highfield Close
Pembury, Tonbridge Wells
Kent, TN2 4HQ

MIDLANDS MECCANO GUILD

The Twentieth Meeting of the Midlands Meccano Guild was held at Alcester, Warwickshire, on Saturday 24th September. The hall was open at 10.00 a.m. and early arrivals were soon setting up their models. The retreat to a local hostelry for lunch was very welcome – the varied conversations soon developed to the prime subject: the mutual hobby, and the many Shows members. had attended throughout the year.

Back in the hall, after the initial brew and biscuits, the Chairman called order at 3.00 p.m. giving a welcome to all and introducing the new members. Then followed the tour of the models; several members described their models and gave working demonstrations. Refreshments were available at 4.30 p.m. and the AGM was called for 5.30 p.m.

The Chairman opened the meeting and asked the Guild President, Mr. Esmond Roden, for the year's review. Esmond stated that the Guild had had a successful year having attended several shows and generally showing the Flag at every opportunity. With the quality and quantity of members, Esmond could foresee the continued success of the Guild.

The Hon. Sec. also reported a successful year, with members attending many shows. The Guild had 60 members in the U.K. and 6 members overseas. The Hon. Treasurer reported the Guild in a sound financial position. After a small discussion, the Balance Sheet was accepted by the Meeting.

A suggestion to revive the Guild Gazette was accepted by all, providing a volunteer was forthcoming to produce it. Two members said they would get together and produce a Gazette, but not at regular intervals. The members expressed their grateful thanks.

Coming to Election of Officers, there were no resignations and no retirements and so the Officers agreed to be re-elected, en bloc, and the members agreed to accept them for the next year. The position of Vice-President of the Guild was discussed and agreed to be held over till March when further information would be available.

The meeting discussed Shows for 1978 where the Guild would exhibit as a unit. It was agreed to exhibit at the Stratford Charity Show, at the Clitheroe Exhibition, the Huddersfield Exhibition, the Stoneleigh Town and Country Festival and the Henley Exhibition. Individual members would be free to show where they wished. Henley Exhibition's sponsor, Mr. Geoff Wright, expressed his thanks to the Guild for members' support at his 1977 Exhibition.

The Guild proposed to meet twice in 1978; on Saturday, 25th March and on Saturday, September 25th or October 7th, depending upon the availability of the hall. This meeting eventually closed with general agreement that it had been an excellent meeting, thoroughly enjoyed by all.

ERNEST CHANDLER, Secretary

NORTH EASTERN MECCANO SOCIETY

The previous year proved to be a very busy time for members of the Society. Ordinary meetings were regular and well-attended, with committee meetings held on a less frequent basis to deal with the business side of things.

Seven members journeyed over the Pennines in April to attend the NW Meccano Guild Exhibition at Clitheroe. Three weeks later we staged a Mini Exhibition of over 30 models in the Town Hall, Northallerton (N. Yorkshire). This followed our theme of 'taking Meccano to the people' as it were, by staging small exhibitions within the area of the Club. Our next Mini Exhibition will be held next month, on February 18th, in the YMCA Hall, Stockton-on-Tees (Teesside) when we hope to make ourselves a little more known in this area.

In the summer months, models were also on show at the Masham Steam Rally and the Great Yorkshire Steam Fair at Castle Howard, spreading the news that Meccano is very much alive and kicking.(or ticking!)

One of the highlights of the year, was the participation in the Jubilee Festival of Leisure, staged for three evenings in Darlington during July, when over 4,000 people wandered round to see over 40 hobby type Clubs and Societies and what they each do. Stretching over three tables, the Meccano stands attracted a great deal of attention.

Some adult members have made lengthy journeys to various exhibitions including the Pennine Show in Huddersfield, and Henley-on-Thames, when a mini-bus was hired for the occasion.

Many interesting models have appeared at various meetings during the year, ranging from clocks to teleprinters, meccanographs of all types, with many models of earth-moving equipment, such as excavators and bulldozers.

By the time this is read, our Annual Exhibition in Darlington last November will be a pleasant memory, but one which will be revived in a pictorial review in the next M.M.

FRANK A BEADLE

NORTH WEST MECCANO GUILD

In the period since the last NWMG report in the M.M, we have steadily increased our membership which now stands at 33. Other aspects of Club activity have improved, with many dealer displays by members, more varied contributions to our "Bits & Pieces" gazette and the acceptance of the April Meccano Exhibition as a regular annual feature.

The latest Club meeting was on October 15th at Scarisbrick Church Hall in Wigan. Attended by 18 modellers, a very wide selection of high-class Meccano models was on show. Richard Watson of Manchester displayed the tallest model of the afternoon, an SML Derrick Crane. Although closely resembling the original in outward appearance, Richard had found it necessary to re-design the mechanics to get the best from it. Also by Richard, an exceptionally smooth-running loco valve gear demonstration model was shown to the meeting. An especially high standard of construction is always employed by Ernest Keighley of Longton, Preston, and his latest Rapier Loom was another superb performer. Patriotically co-inciding with the Queen's Jubilee, a red, white and blue pattern was being woven at the time of display.

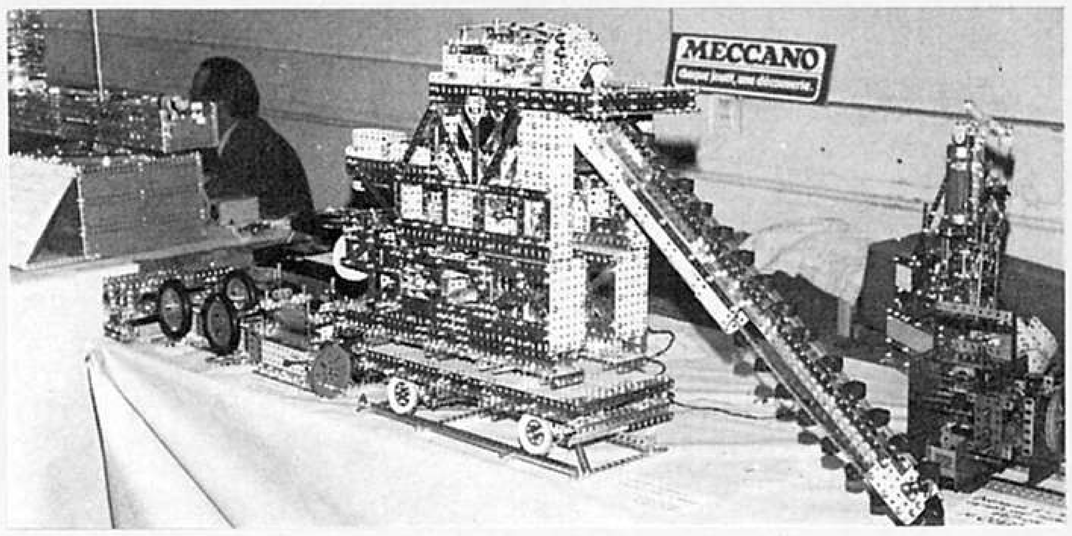
New member Alan Holman of Warrington is a Jack-of-all-Trades as far as Meccano is concerned, and to prove it he showed two models, one a quiet, accurate Grand daughter Clock and the other an SML Ship Coaler. Diverse indeed! Norman Mason's version of the famous Magician by Servetti was a real eye-catcher in brilliant new parts, and performed a vanishing trick with Dinky Toy cars. Graham Brown's bewilderingly complex computer-programmed Writing Machine was a spectacle of motors, wires and switches, and so heavy the table supporting it collapsed! Luckily, no damage resulted! Philip Dandy of Standish added a touch of nostalgia with a vintage Rolls-Royce, accurate in every detail and powered by an electric motor concealed underneath. Member Brian Bloor of Burnley showed the third Supermodel of the day, the Howitzer from Leaflet 36. To complement this, Brian designed his own half-track which included fully-pivotting axles and scale speed drive among its many features.

Something of a Motor Show atmosphere surrounded the contributions from the contingent from Clitheroe. Michael Harrison's vision of motoring in the future resulted in the most exciting, futuristic-looking model car we've seen to date! David Cowgill's latest improved American car sported double motors, carpets, vinyl roof and a host of other refinements to bring it into the luxury class. Roger Dickinson's American type panel van also had the accent on features with a dazzling array of remote-control functions and superb spring suspension.

After the usual business meeting and refreshments, the meeting was closed at about 6.00 p.m. and everyone agreed it had been another very enjoyable get-together. The next NWMG function will be the Meccano Exhibition on April 8th, 1978, in Wigan.

MICHAEL J. WALKER
Hon. Secretary

Bill Roberts of the H.T.M.C. visited the 'Congres Des Amis Du Meccano' in Paris last May. One of the many fine models he saw was this Trench Digger by U. Bachelard of Zurich, Switzerland.



NORTH MIDLAND MECCANO GROUP

The Inaugural Meeting of the North Midlands Meccano Group was held on 17th September at Bleasby, Nottingham, when it was officially agreed that a Club should be formed and should carry the above title. It was also agreed that there should be three meetings per season; one in September/October, one in January and one in April/May. It was further agreed that the subscription for the season, beginning with the 17th September meeting, should be £1.50 for seniors and 50p for juniors under 16 years of age. The following officers were elected: Chairman - Bert Shaw; Treasurer - Mike Pashley; Secretary - Geoff Coles.

A remarkably large number of models were brought along to the Meeting, far too many for each and every one of them to be described here – and the standard of modelling was excellent. It would be wrong to single out individual constructors without mentioning everybody, so suffice it to say that the subjects covered were as diverse as one is ever likely to see anywhere. There was everything from comparatively small outfit models through mechanisms, clocks, traction engines and heavy-duty vehicles, to the odd giant dragline or two! There were fairground rides and live-steam models powered by both current Meccano Steam Engine and the rare and fascinating 1929 version.

Time and space were represented, the former by several clocks and the latter by an Orrery as well as by an astronomical clock. Remote control was of course the order of the day with many presentations, but there were also several automated models which fascinated the spectator, including two synchronised dancers, a pair of duellists and an automatic tram car. Transport, generally, was well represented with fine examples drawn from land, sea and air.

Special thanks for their help go to the group who so nobly provided the tea and biscuits to keep the proceedings rolling along, and indeed, thanks also go to table-shifters and all who helped in any way. The same hall has been booked for our next meeting on January 21st

Anyone interested in joining the North Midlands Meccano Group should contact the Secretary, G. M. Coles, "Little Court", Bleasby, Nottingham.

PENNINE MECCANO GUILD

The big event in the Guild's calendar in recent months was undoubtedly its First Annual Meccano Model Exhibition on May 21st at Huddersfield. Fifty-three superb models were on display and the Guild would like to express its thanks to the many modellers from other clubs for the support they gave us, and for the magnificent creations with which they delighted and astounded the visiting public.

Many of the models at the Exhibition were seen again at the Club Meeting on October 22nd at the Broadoak Cricket Club at Linthwaite which was attended by 17 members. The Guild was delighted to welcome two new members to the meeting; Jack Pickles of Bradford and Hal Hussey of Warrington.

The October Meeting saw several sweeping changes in the constitution of the P.M.G. The position of Honorary President of the Guild was bestowed on founder member Norman Chapman; his role as Chairman was opened to the meeting and John Hornsby was duly elected. A new office of Treasurer was created and the duties were bestowed on David Fairbanks. Bill Charleson retained the position of Secretary.

On this, the third birthday of the Guild, the body finally succumbed to the ravages of inflation and the membership subscriptions were raised 50%, with a small charge being introduced for its junior members.

The first of the new models to be seen at the October Meeting was Mike Pashley's partially completed Ransomes & Rapier W1800 Walking Dragline. Like its real-life counterpart, Mike's model was a multi-motored machine, both PDU's and the new crane motors being employed to power its many functions. Another new model was Geoff and Francine Coles' reproduction of the High Peak Railway system. This consists of a Beam Engine, beautifully reproduced powering winding gear to draw wagons up and down an incline. Another model from the steam era was Julian Coles' freelance steam roller. Built around the popular 5" rear wheel scale, this model had realistic motion work and a neatly constructed front roller.

John Bader's 8-Wheel Foden Rigid is nearing completion and shared its table with a much earlier model of the marque, Tim Spooner's Foden Steam Wagon.

Models seen for the second time at a P.M.G. meeting were John Hornsby's RB61 Crawler Crane; Alan Grimshaw's S.M.L. Pontoon Crane and the Secretary's M3A1 American Half-track. New member Hal Hussey demonstrated his advanced design of Meccanograph pen-arm and crown head; guest Graham Brown had brought his automated drawing machine. Graham is a member of the North West Meccano Guild and is an expert on electrical mechanisms of all kinds.

The 1978 Pennine Meccano Guild's 2nd Annual Exhibition is at the planning stage and will again be held in Huddersfield, probably in early June.

BILL CHARLESON

SOCIETY OF ADVANCED MECCANO CONSTRUCTORS

A near full complement of members of SAMC gathered at the Baptist Church, Hall Green, on 8th October. Bert Love opened the meeting with an account of the problems of the M.M. and the second copy of the "new" M.M. had been received with a mixture of relief and acclaim by the members. Fraternal greetings were sent by several of our overseas members and Jorge Catella had sent a complete set of the latest braced girders from Argentina which were placed on display. This was a present from S. Richini of Meccano Argentine. Meccano Limited (U.K.) had sent plastic labels for Meccano models to most Meccano clubs and these were avaiable to SAMC members.

Many models were on display. Chris Beckett's model of a handling device for disabled people was noteworthy. This model could be moved and steered by its caterpillar tracks using a remote control panel and its mechanised arm was so constructed that items could be picked up from the floor and lifted as needed. The flexibility of drive required was achieved by the use of rotating Spring Cord.

Gerald Griffin showed two novelty models which demonstrated the use of reversing gear boxes to provide a continuous display. In another model he showed the Konkoly clockwork escapement described in the Meccano Engineer in which a switching device had been incorporated which led to alternate activation of two Meccanitians via their electromagnatic muscles, at each rotation.

Hubert Lansley (an ex-'Spanner') showed the Constantinesco Torque Converter which celebrates its 50th anniversary as a Meccano mechanism, having been first described in a 1927 M.M. The interest in the model was balanced by Hubert's fascinating account of the inventor's visit to Binns Road in the heyday of the hobby.

Many other excellent models and mechanisms were on display varying from small and neat vehicle models to large railway engines and cranes.

After the tour of models, tea was taken and parts bought and exchanged. The members of SAMC found this meeting particularly relaxed and friendly and were deeply saddened to learn in their meeting report of the death of one of our recent members – Eric Jenkins – on that morning.

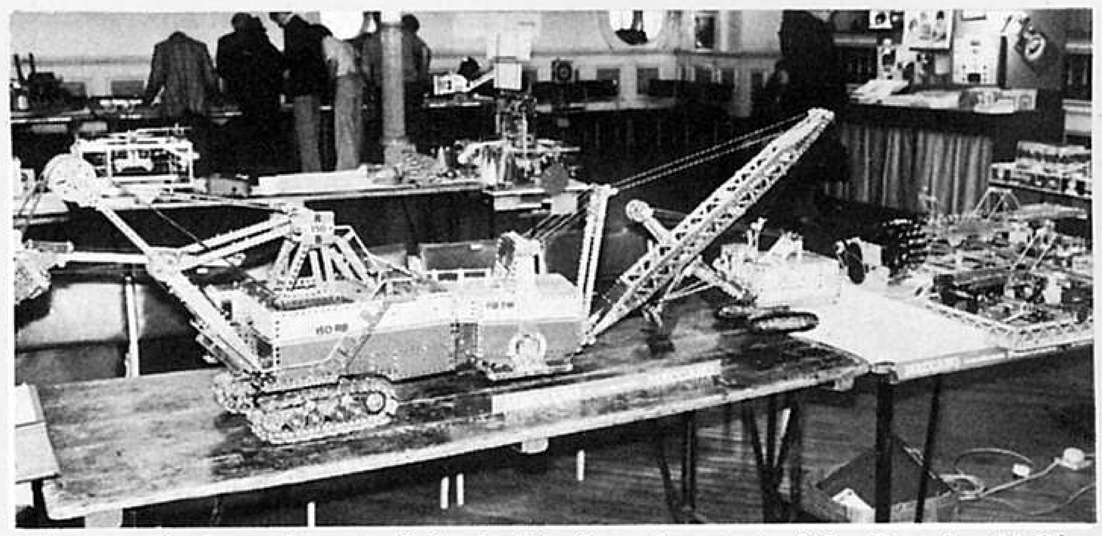
D. N. WHITMORE, Reports Secretary
36 Parkhurst Road
Bexley, Kent

SOUTH EAST LONDON MECCANO CLUB

The sixth meeting of the SELMC took place on 15th October, 1977, at the Salvation Army Hall, Welling, at 2.00 p.m.

The tour of models started with David Whitmore who had completed his pumping engine since the last meeting.

Geoff Davison showed a partly constructed skip-carrying lorry. The lifting and lowering of the skip will be done using a small electric motor. Geoff had also



A general view of part of the hall before the start of the Pennine M.G's Exhibition in Huddersfield last May. In the foreground are Mike Pashley's two Ruston Bucyrus Excavators.

modelled a rail gun and ammunition wagon made with Army Multikit parts.

Four models were brought by Charles Yearsley. Two were standard models from Multikit outfits and one of his other models was of an early Ford car. Charles has also started on a rack and pinion locomotive, based on GMM leaflet No. 56.

A steam engine was shown by Bob Walter. An E20B motor is used to power it and is reversed through gearing mainly to show off Bob's prize possession: the now-obsolete rack segment (Part 129). Neil Bedford brought a small-scale steam engine driven by hand, and a breakdown crane. He also showed a mouse trap that keeps the mouse alive, on cheese, of course!

Adrian Ashford's new model was a pendulum clock, based on the Meccano No. 2 Clock Kit but with a few modifications. It can run for fourteen hours on one winding.

I showed a British Rail class 08 Diesel Electric Shunting Locomotive. It runs on track which is built from Angle Girders bolted to Flanged Plates. There are three straight 26" lengths and one left-hand turnout of similar length. The gauge is 2¼" and a conductor rail runs along the centre of the track. It is insulated with sellotape under the Flanged Plate and around the bolt.

Also at the meeting were Stan Bedford, Richard Whitmore and Richard Greenshields. The next meeting will be held on Saturday 21st January, 1978, at the same time and place. If anyone is interested in joining, please contact the Secretary.

CHRISTOPHER WARRELL (Secretary)
41 Beechhill Road, Eltham
London SE9 1HJ

SOUTHERN CALIFORNIA MECCANO CLUB

Clyde Suttle's residence in Garden Grove, California was the venue for our Fall Meeting which was held on the afternoon of Saturday, 24th September. However, attendance was light and there were few noteworthy items to be recorded. Jack Taylor assumed the duties of Activity Secretary for the Club, while Clyde Suttle will remain as Corresponding Secretary and Newsletter Compiler.

The Club had an exhibition table at the International Toy Buffs Convention on Saturday, 5th November, at the Huntington-Sheraton Hotel in Pasadena, California. Much interest was shown in our presentation, but it is hoped to mention this in greater detail in the next M.M. The next meeting of the Club will be on Saturday, 7th January, at the residence of Anton Calleia. Anton has been quite busy lately selling the City of Los Angeles as the site for the 1984 Olympic Games. Anton should be the champion marathon distance runner known before the Games are finished!

At the time of writing, Don A. Redmond of Kingston, Ontario, Canada, is enjoying a prolonged trip to England where he was last seen taking in the Exhibition at Henley-on-Thames.

The Club tries to keep up on known Meccanomen and what they are doing, even though they are not members. Some members may have known Earl E. Bennett of Poughkeepsie, New York, who passed away this last April. On a happier note, Bob Bowley and family of Desmoines, Iowa, made a trip through New York and Appalachia, visiting L. Steinagle and Keith Cameron en route. Gerrard S. Boyer of Edmonton, Alberta, has moved and anyone knowing his new address, would they please inform the Club Secretary.

We welcome to our ranks new member T. E. Holls of Wabbingers Fall, New York.

CLYDE T. SUTTLE Jr
Corresponding Secretary
6062 Cerulean Avenue, Garden Grove
California 92645

STEVENAGE MECCANO CLUB

This report brings you news of our activities from early June until Henley 1977.

On 6th June, Alec Webb's 'Roby', a Meccano robot, was to be found at the Elim Pentecostal Church at Letchworth posing pre-taped questions to a fascinated group of children, all eager to supply the answers. Surely this must be the most unusual role ever played by a Meccano robot!

We had two fixtures on the 18th June. Paul Blythe, Dennis Higginson, Eric Evans, Geoff Bolt, Stephen Kuc and Terry Pope and a band of his youngsters from Wellingborough were on duty at an exhibition in the Bramingham Centre for the Mentally Handicapped at Luton where 35 models brought joy to the eager crowds; meanwhile, other stalwarts, led by Peter Brown, put on our 8th annual show at the Pin Green Junior School, Stevenage. Alec Webb's Eiffel Tower was pictured later in the local paper.

Other modellers to be found at Pin Green that day were Victor Whitbread (trams), Jock Proud (train), Keith Assender (robot) and Peter Neville, who displayed a spate of assorted models including the No. 10 set Beam Bridge.

On the 9th July, for the first time ever, the Club entered a float in the Letchworth and Hitchin Carnival. Alec Webb organised the whole thing and took as his theme the success of Liverpool in the European Cup. Such slogans as 'You score every time with Meccano' appealed to the crowds lining the route. A small generator supplied power for the working models displayed on the float, and not one mechanical failure occurred during the whole event.

On the 16th July, Club members made their way to the Hornby Railway Exhibition at the North Avenue Church, Letchworth, for a thoroughly enjoyable day out.

That brings us to the Henley shindig; where Peter Brown showed his impressive space shuttle model for the first time. Neil Alston brought along his fire engine; Roger Le Rolland displayed his aircraft models; and Stephen Kuc's ubiquitous simplicity models were also to be seen. 25 members in all went along.

The SMC always grows bigger in the Henley season, and this year was no exception. We have the following new members since our last report:

Adults : Eric Evans, Luton; Jack Wilson, Stevenage and Bill Woolliscroft, Leek, Staffs.

Junior: Andew Hewson (11), Stevenage and Colin and Philip Woolliscroft, Leek, Staffs.

Dennis Higginson, the Secretary, looks back on a successful summer and thanks all the SMC personnel for their efforts in 1977, including all our far-flung outside members who represent us at all sorts of shows and functions nationwide.

In conclusion, SMC members wish all their fellow Meccanomen a very happy and constructive 1978.

BERNARD DUNKLEY

DINKY TOYS NEWS

A REVIEW OF THE DINKY TOYS INTRODUCED SINCE THOSE FEATURED IN THE LAST M.M.

No. 207 TRIUMPH TR7 RALLY CAR

Catching on to the considerable public interest in rallying is this new Dinky Toy Triumph TR7, specially finished in the highly distinctive livery of a Leyland-sponsored competition speedster: white with red, white and blue flashes down the sides and a large red, white and blue "chevron" covering most of the bonnet area. Emblazoned across the boot lid is large Leyland identification leaving spectators in no doubt to the parentage of the car!

The model itself, like the standard "civilian" version which is also available as a Dinky Toy, features a smart and detailed body casting complete with opening doors, windows and a beautifully detailed interior moulding reproducing seats, steering wheel, dashboard and even the transmission tunnel with gear-change lever. In addition, the toy is fitted with unique spring-loaded bumpers which press inwards on impact to absorb shocks! Overall length is 98mm.

No. 122 VOLVO 265 DELUXE ESTATE CAR

This crisp, clean and attractive model is based on the extremely popular Swedish vehicle which is now a common sight throughout virtually the whole of Europe.

The Dinky version reproduces all the distinctive lines of the real car within a smoothly-detailed body casting. Outlines of doors, door handles, petrol-filler access door – even the 265 DL identification – are present, together with a moulded radiator/base unit which is complete with clear plastic headlamp inserts. An opening rear door in the body allows access to an interior complete with moulded windows, detailed seats and steering wheel.

Produced to 1/35th scale, the Volvo has an overall length of 141mm.

No. 384 CONVOY FIRE RESCUE TRUCK

Fourth model in the new "Convoy" range of budget-priced commercial vehicles (see "Convoy Gift Set") the Fire Rescue Truck is a particularly appealing toy with a fireman's platform on the end of a two-section snorkel arm. The arm, which elevates realistically, also rotates through 360° and the platform itself swivels up and down as desired. Included in the platform moulding is a representation of a water hose nozzle.

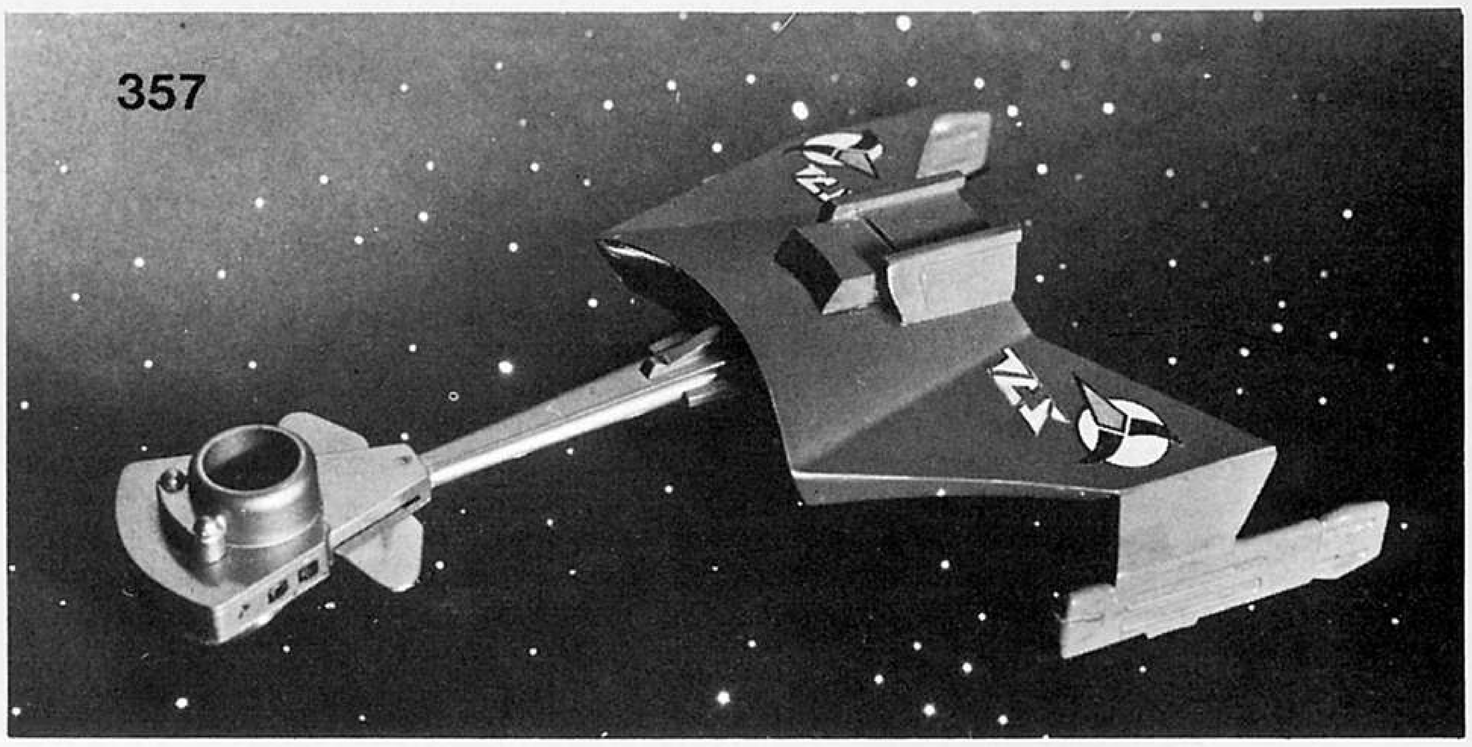
With a red body, carrying "RESCUE" lettering down each side, the toy is fitted with windows and seats and runs on low-friction Speedwheels. Overall length is 126mm.

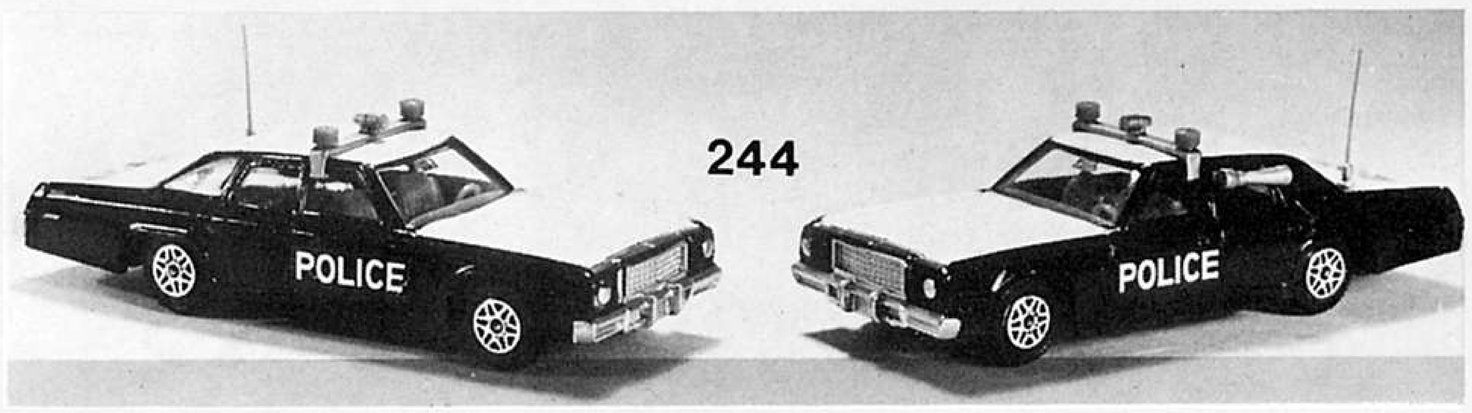
No. 399 CONVOY GIFT SET

"Convoy" is a brand new idea for Dinky toys – a unique range of budget-priced Dinky toy commercial vehicles, all equipped with similar cast metal cab/chassis units, but supporting different rear body work mouldings with different identities. The new toys are unique in that, instead of the cab being based on anything already existing in real life, as is the usual case, it has been specially designed

for Meccano by professional Industrial and Automotive stylists, Ogle Design of Latchworth England, who see it as having the practical cab-look of the future.

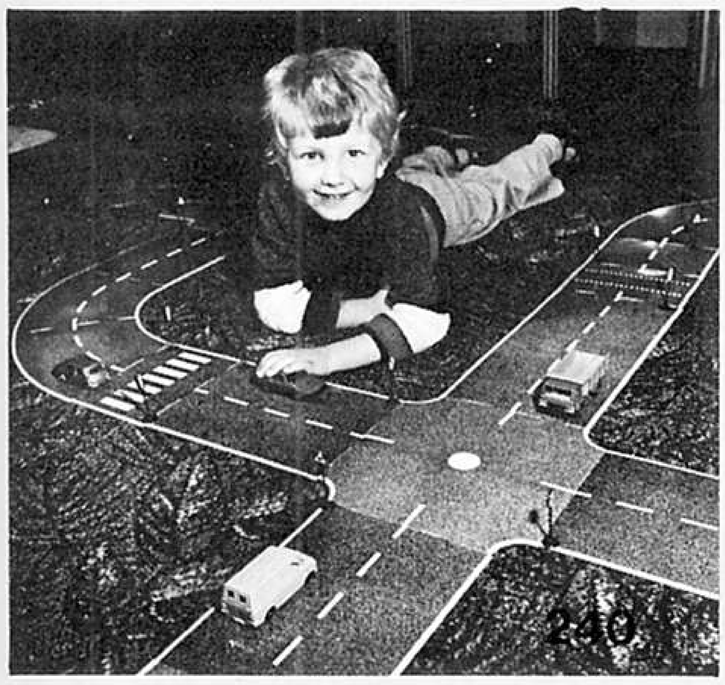
The first three vehicles in the range represent a Skip Truck, a Farm Truck and a Dumper Truck, each with its own special feature. The Skip Truck has a removable skip on a pivoting support which swings the skip on and off the truck like the real thing. The Farm Truck has a high-sided, slatted load body with an opening tailgate. The Dumper Truck, modelling the large, heavy-duty type of vehicle, is fitted with a tipping load body. All three toys are marketed together in a single Gift Set, although they should be available separately at a later date.





No. 240 DINKY WAY

A complete road layout game in one eye-catching set, Dinky Way is a brand new fun-packed product which teaches budding young motorists the rudiments of road sense while they are still playing on the living room carpet! The set consists of 37 various roadway sections – straights, curves, junctions, etc. – which lock together to form a whole variety of road layouts. Also supplied are four traffic lights



and twenty road signs, plus four action-packed Dinky toys for use on the roadway: A Police Mini Clubman, a Triumph TR7, a Bedford Van and a Dumper Truck. Produced from tough card, realistically shaded and varnished, the roadway sections are ready-printed with carriageway markings and, together, they make up into more than 6 metres (20 feet) of roadway. All the sections are interchangeable so that they can be arranged in many different combinations to produce many different layouts. Play value is clearly enormous!

An export version (No. 237) is also available containing the civilian Mini instead of the Police Car and with the Roadway markings arranged for driving on the right.

No. 357 KLINGON BATTLE CRUISER

Largely as a result of popular demand, Meccano Limited have introduced this exciting Dinky Toy model of the Klingon Battle Cruiser – the villainous antagonist for Captain Kirk's U.S.S. Enterprise in television's famous "Star Trek" series. Meccano already produce the Dinky Enterprise and, since its introduction, young collectors have clamoured for the Klingon ship as being the perfect target for the Enterprise's "photon torpedoes".

A strong toy, 228mm long with a wedge-shaped forward control deck, slender fuselage and large predatory-type main wings, the Klingon Battle Cruiser has a distinct "bad guy" look about it! But the battle for space will not be all one-sided – the Klingon ship also fires photon torpedoes! Three harmless plastic discs are loaded into a missile magazine inside the nose section and are fired by pressing a "trigger" disguised as a small stub wing projecting from the control deck.

No. 244 PLYMOUTH POLICE CAR

Instantly identifiable as a typical American Police Car, this model is based on the Plymouth Fury which is a vehicle popular with many Police Departments in America. A large, chunky typically-American car, it has black sides, front and back with, in sharp contrast, a white bonnet, roof and boot lid. Large "POLICE" identification appears on the boot lid and on the side of the front doors while mounted on the roof is a moulded console incorporating two imitation red warning lights and an imitation siren. A moulded representation of a radar speed-checking device is mounted outside the left-hand rear door window and a radio aerial protrudes from the rear wing on the same side. Windows, seats and steering wheel are also fitted, while high-speed chase performance is provided by low-friction Speedwheels. Overall length is 161mm.

No. 123 AUSTIN PRINCESS 2200 HL SALOON

Based on the unique and distinctive "Wedge" from Leyland Cars, this appealing toy captures all the unusual atmosphere of the real car. Casting quality is first-class, with fine detail work including such things as door handles and even an outline of the petrol-filler access door. Glazed windows are fitted and a fully moulded interior complete with steering wheel and detailed realistic seats. Produced to 1/35th scale, the toy has an overall length of 128mm and is finished in a smart bronze colour with black rear roof pillars simulating the vinyl-covered pillars of the real car.

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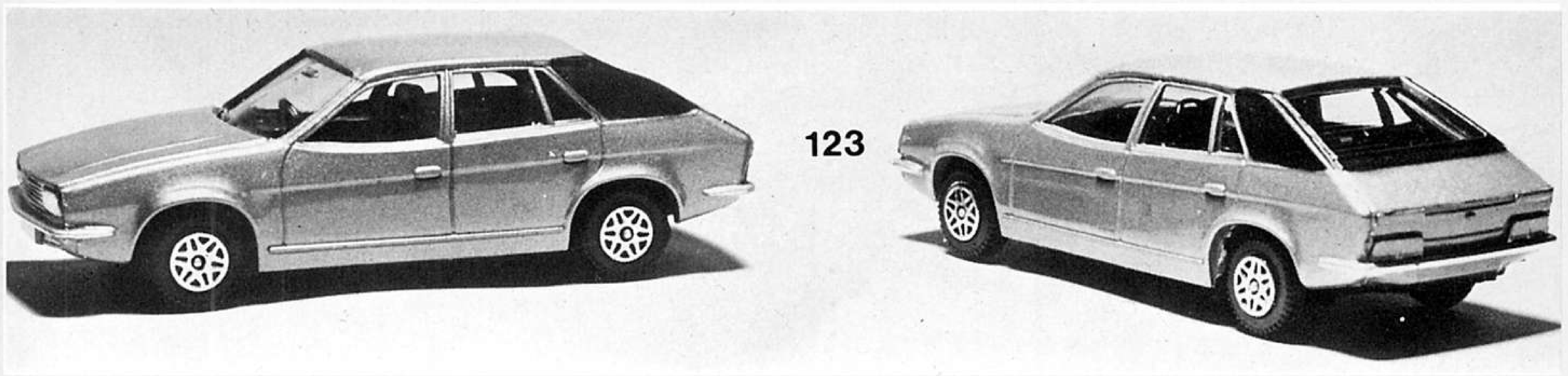


M.M. COMPETITION PAGE

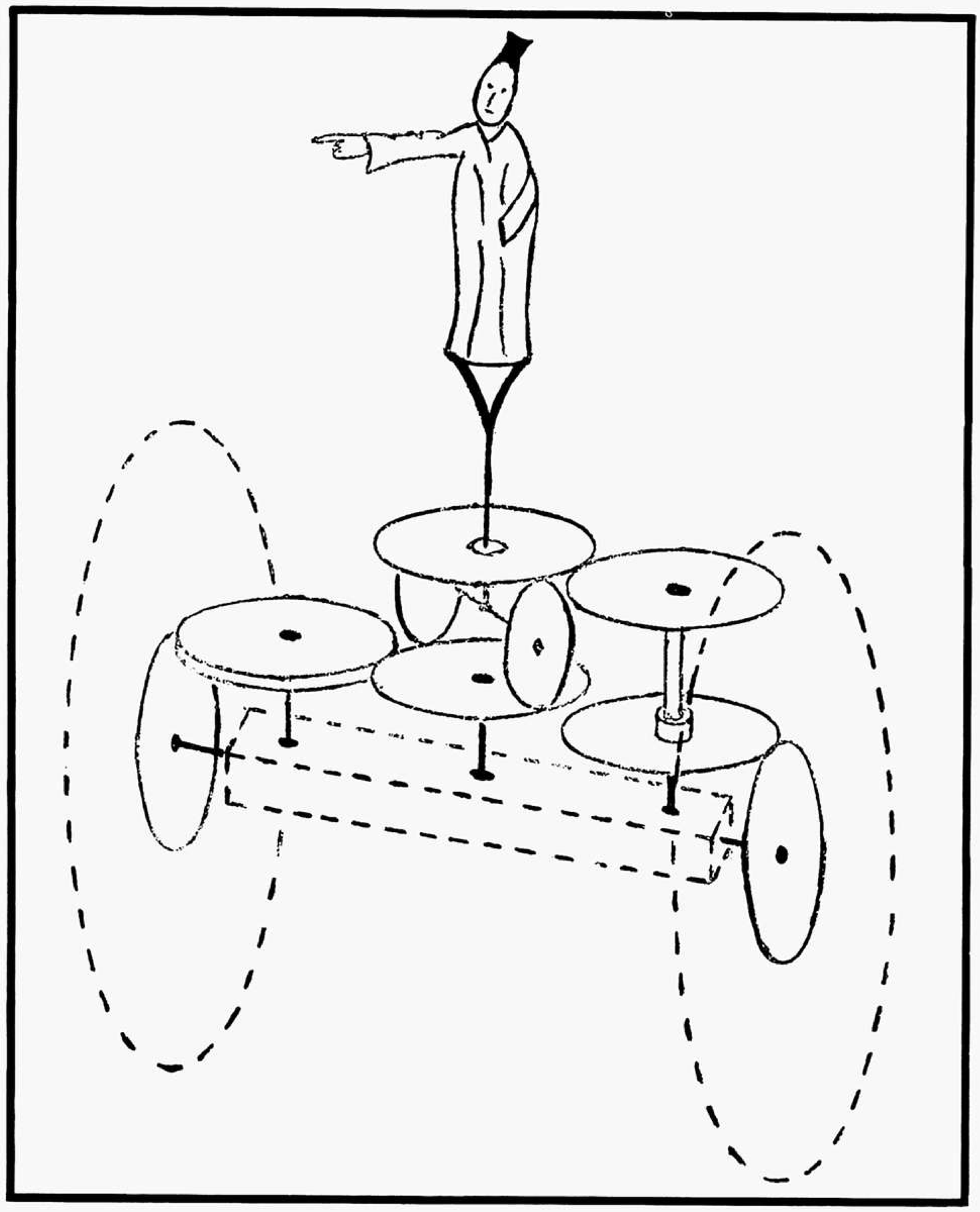
In the M.M. for January 1977 (writes Alan Partridge), pages 30 and 31, Terry Morris gave us an excellent account of the so-called Chinese Self-seeking Chariot. I do not wish at this stage to enter into the controversy as to whether or not it was in fact an ancient Chinese invention, but I must say that it is a very entertaining device. In letters in the last M.M, page 67, two writers refer to the article by Frank Cousins in M.M. September 1955, pages 498/499, and Dr. Keith Cameron claims that no one has followed exactly the design by Mr. George Lanchester which appears in Mr. Cousins' article.

So that everyone will start level, fig. 1 shows Mr. Cousins' sketch re-drawn. The vertical central shafts carry wheels which appear to function both as spur gears and as bevels or contrates! No wonder the design has not been copied exactly! If each of these is made from a Meccano Gear and a Contrate bolted together as done by M.J. Oliver, M.M. January 1957, page 36, a total of eleven gears is needed. Terry Morris used only 10 gears, but could the number be reduced still further?

Clearly we could omit one Pinion from the differential in either version, or we might use one of the differentials I described on page 70 of the last M.M. However, further economies are possible. Indeed, I'm not saying whether or not any differential is needed at all, but if it is, it is not in the internal details of this that the chief saving is to be made.

The exact object of this month's problem, then, is this: design a chariot or hand cart running on two equal wheels. The line joining the centres of the wheels is to be at right-angles to the plane of rotation of each wheel (this is to distinguish a chariot from a bicycle). The body of the chariot is to carry a horizontal pointer rotating about a vertical axis. The two wheels and the pointer are to be connected by gearing in such a way that, however the chariot is moved, with its wheels remaining in rolling contact with a smooth horizontal surface, the pointer continues to point in the same direction. The smallest possible number of toothed parts is to be used and, as usual, the mechanism is to consist of standard Meccano Parts without mutilation and non-conventional alignments, with no cord or belt drive or other frictional device.

Solutions to the problem should be addressed to Chariot Competition, Meccano Magazine, Binns Road, Liverpool L13 1DA. The designer who we feel produces the best solution will receive a token prize in the form of a Crane Kit motor.



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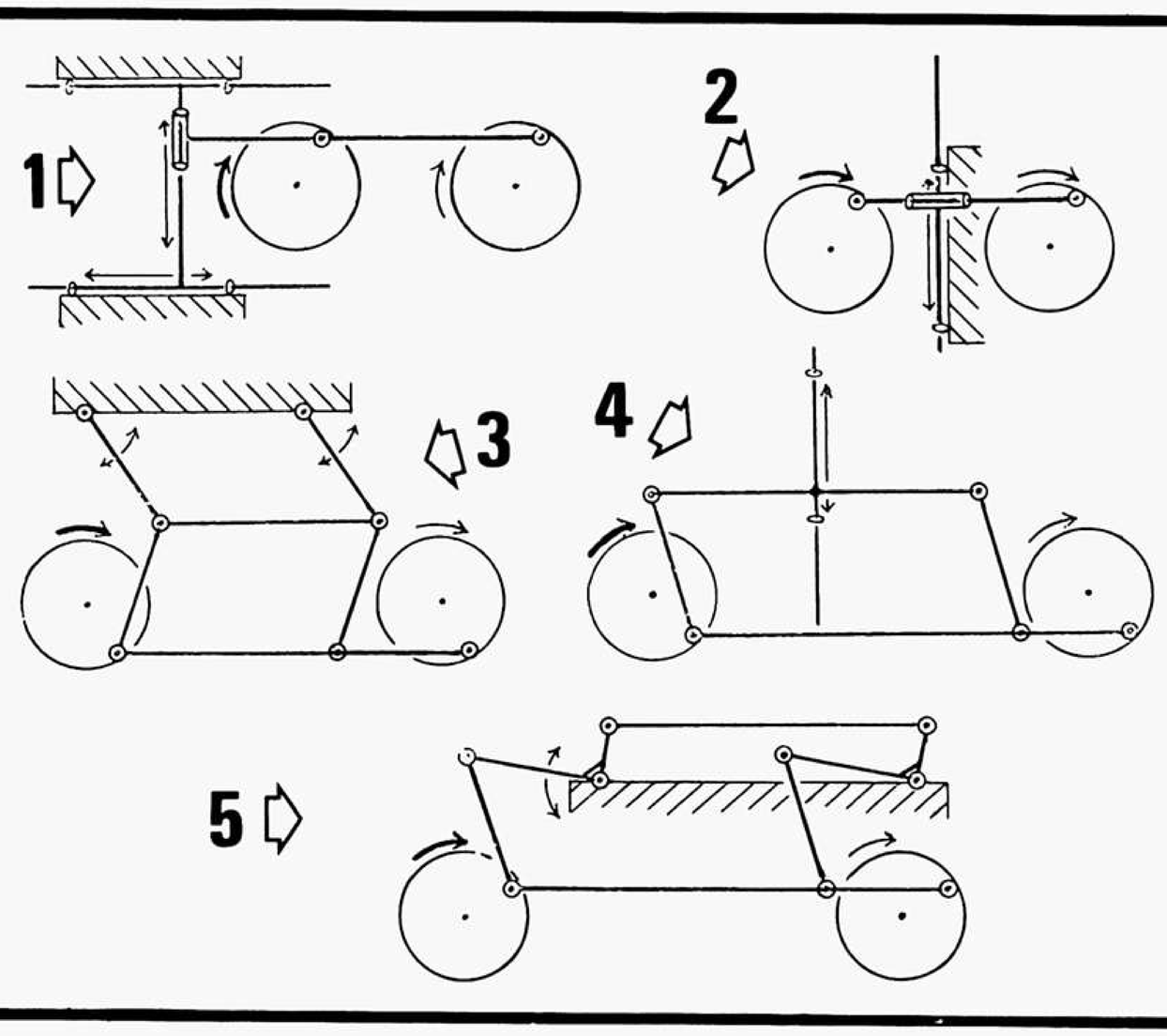
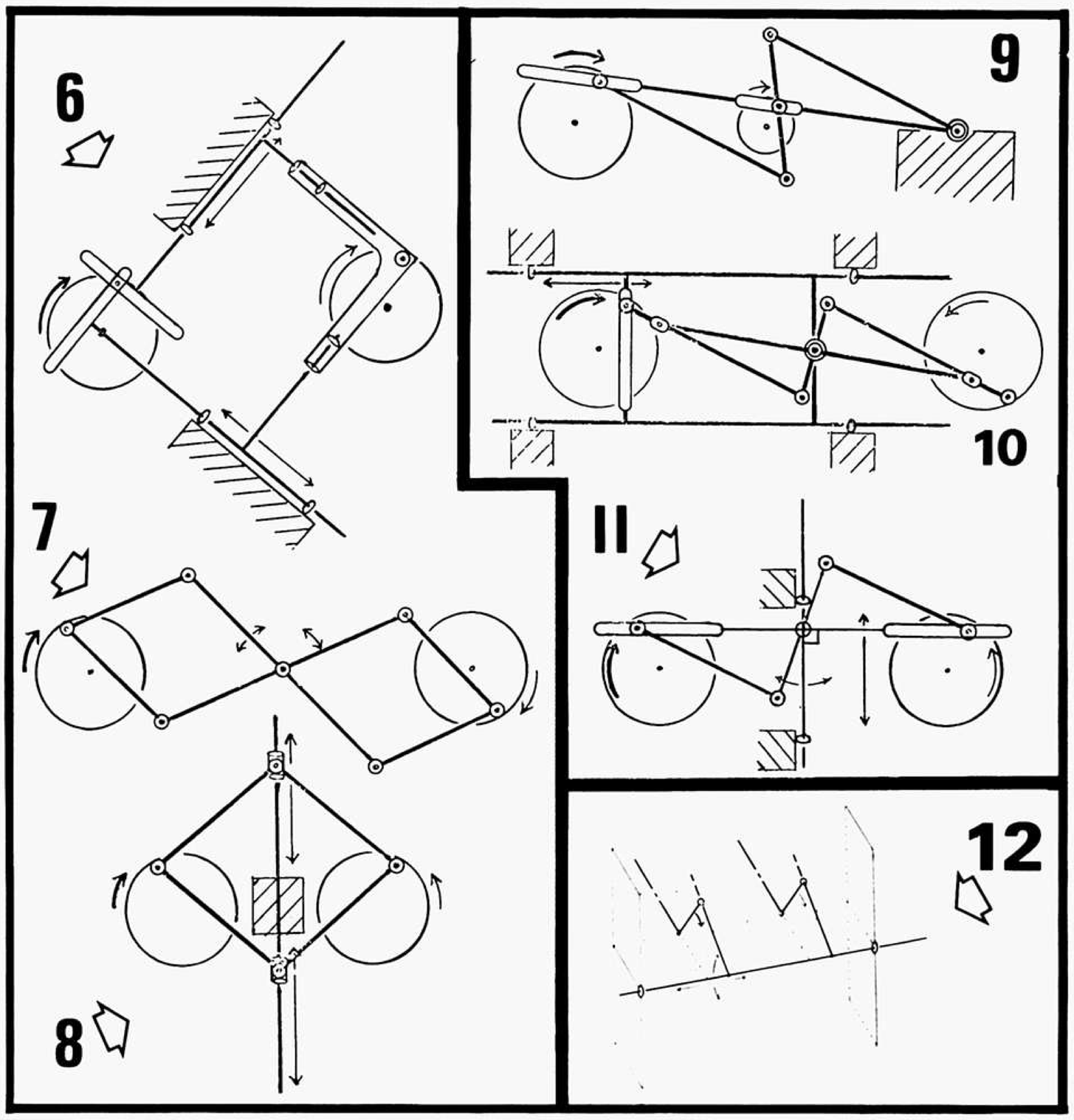
"CHUFF–CHUFF" COMPETITION

(Alan Partridge's solution to his contest in the last M.M)

I promised I had ten different solutions to this. I have since found four more, but dropped two of my earlier ones which were rather dodgy. So here in sketch form are a dozen which all work well. To keep things simple I have not shown the fixed bearings for the driving and driven wheels, but I have shown, by blocks of shading, fixed supports for the link-work.

I have shown the driver by a heavy arrow and the driven wheel by a lighter one. There are also, in some cases, arrows to show relative motions between different parts of the link-





work; straight for sliders, curved for pivots.

The mechanisms fall into four groups. In the first group there is a conventional connecting rod, with additional links to make sure it can only move parallel with the line of driving and driven wheel centres. No. 1 and No. 2 do this with sliding movements only, and are rather similar; each contains sliders in two directions at right-angles, but they differ as to whether the slider on the fixed framework is horizontal or vertical; the other then goes to the connecting rod. Nos. 3, 4 and 5 use parallelogram linkages or various kinds.

The second group contains three mechanisms Nos. 6, 7 and 8, in which rotation is resolved into the movements at 45° to the line of centres and at 90° to each other. No. 6 uses sliders only, and is rather like using two connecting rods 90° out of phase, so you may think it is a bit of a swindle, but it does fall within the scope of my carefully worded conditions! No. 7 uses pivoted links only, and drives 180° out of phase. No. 8 uses links and sliders, and drives in reverse direction! (This was not forbidden) Nos. 7 and 8 are both rather pretty to watch.

The third group also contains three mechanisms, Nos. 9, 10 and 11 which have in common the absence of anything like a conventional connecting rod, but three links in a 'Z' formation variously combined with sliders. Nos. 10 and 11 reverse the direction of rotation, a fairly obvious result of the 'Z' linkage, but No. 9 does not! Instead the driven wheel is only half the size of the driver.

The fourth group is a single mechanism, No. 12. It does not work in a single plane, so I have had to attempt a perspective view of it. There is a sort of connecting rod, but it has oscillating rotary as well as linear motion. The two rods offset from this are identical: each is joined to the radius from the driving or driven shaft by a combined sliding-cum-ball joint.

Minor variants are possible in Nos. 9, 10 and 11 by interchanging pivot points and sliding contacts in various levers. Not counting these, and even if no more mechanisms are discovered, you can get 66 pairs from the above! It will be difficult (some would say arrogant) to say which pair show the most difference, but I reckon No. 12 is different from all the rest.

Lucky winner of the "Chuff-Chuff" Competition was Mr. Phil Ashworth of Kirk Ella, Hull.

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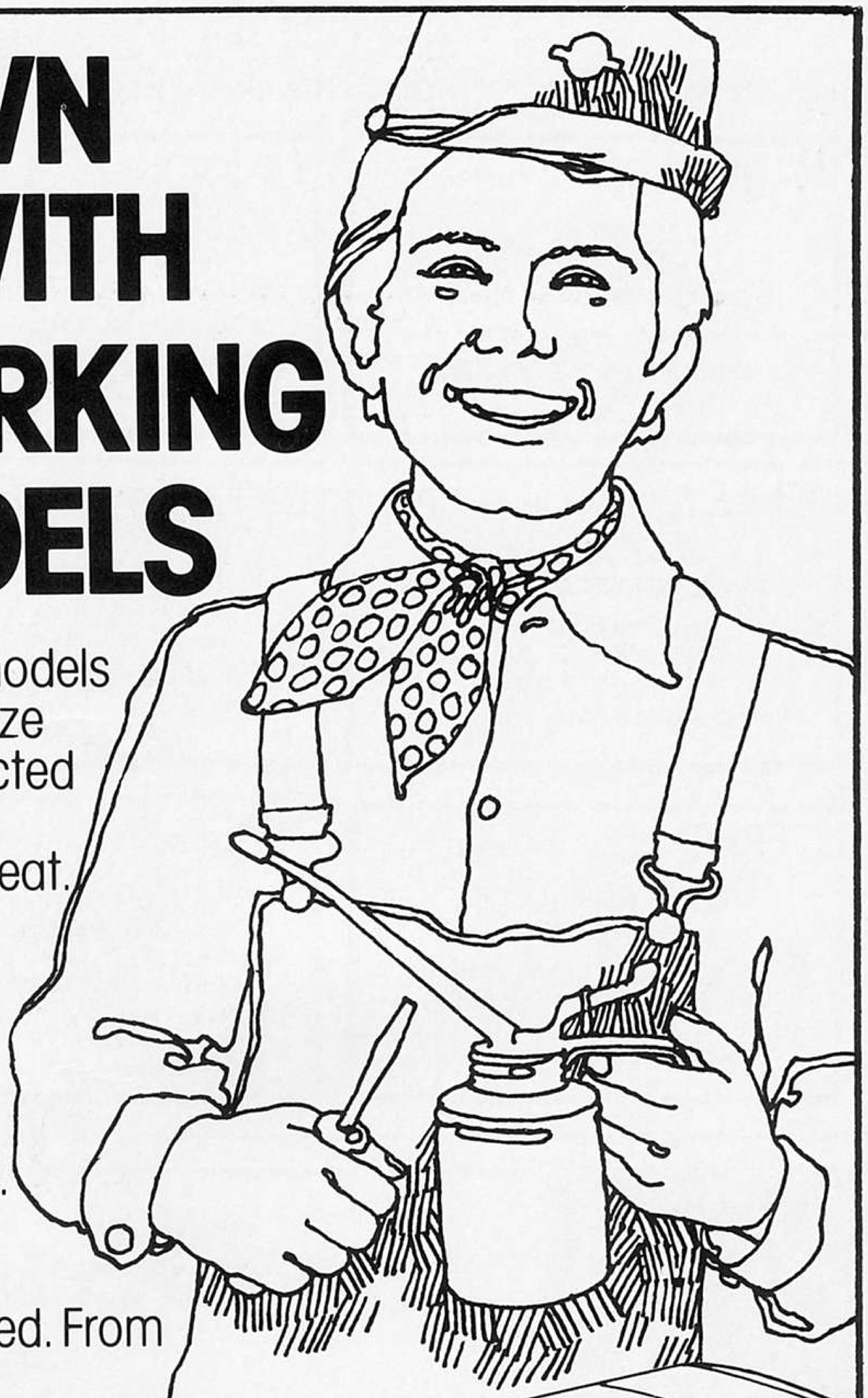

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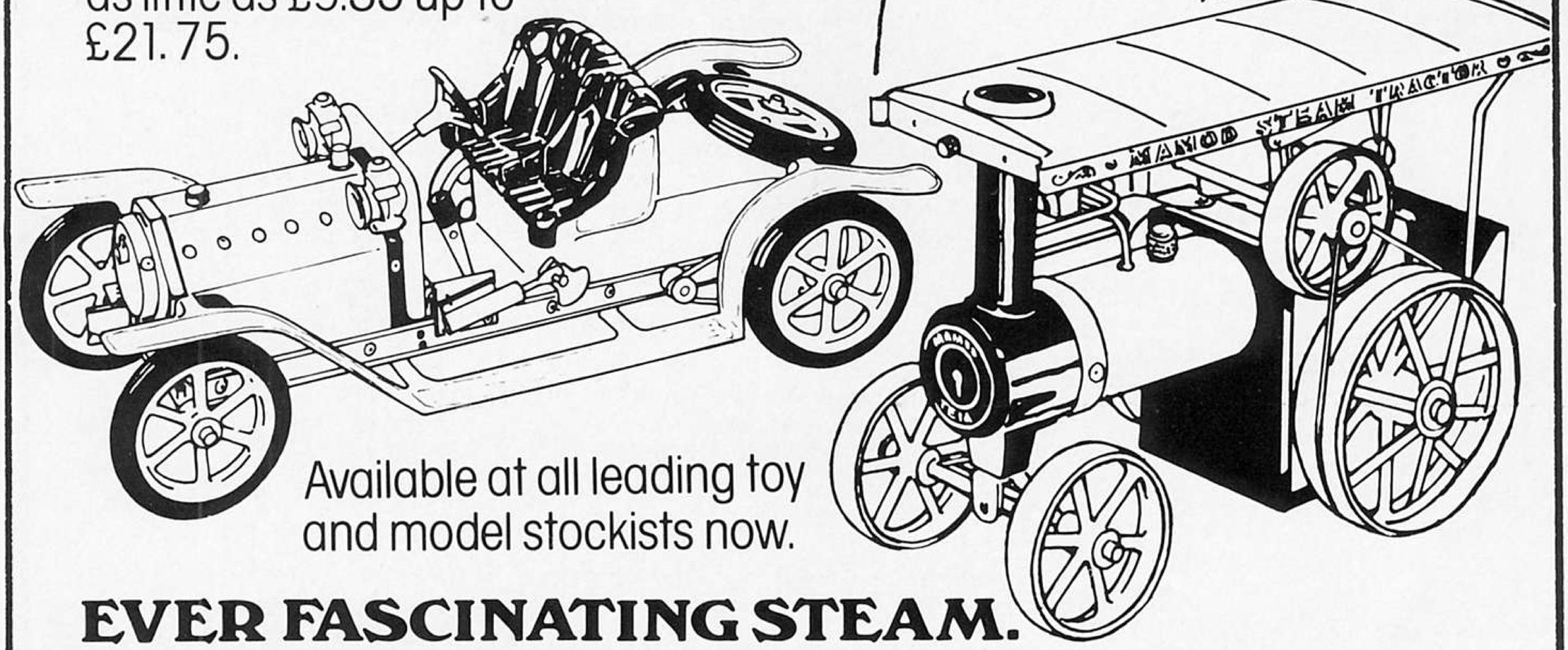

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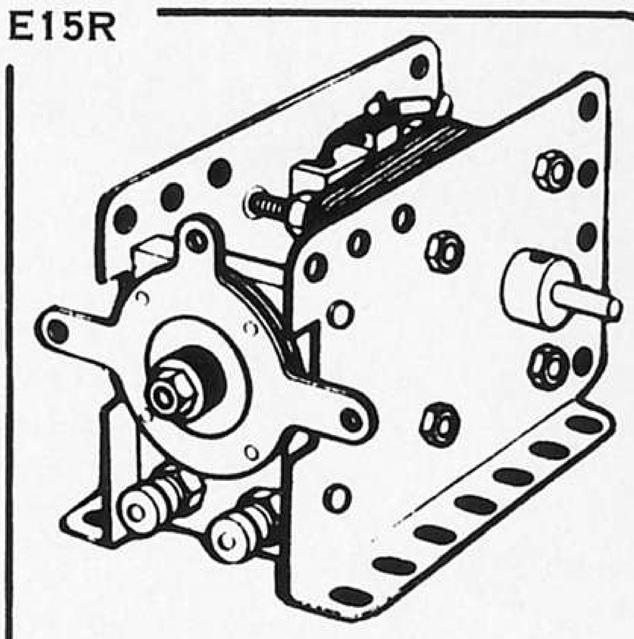

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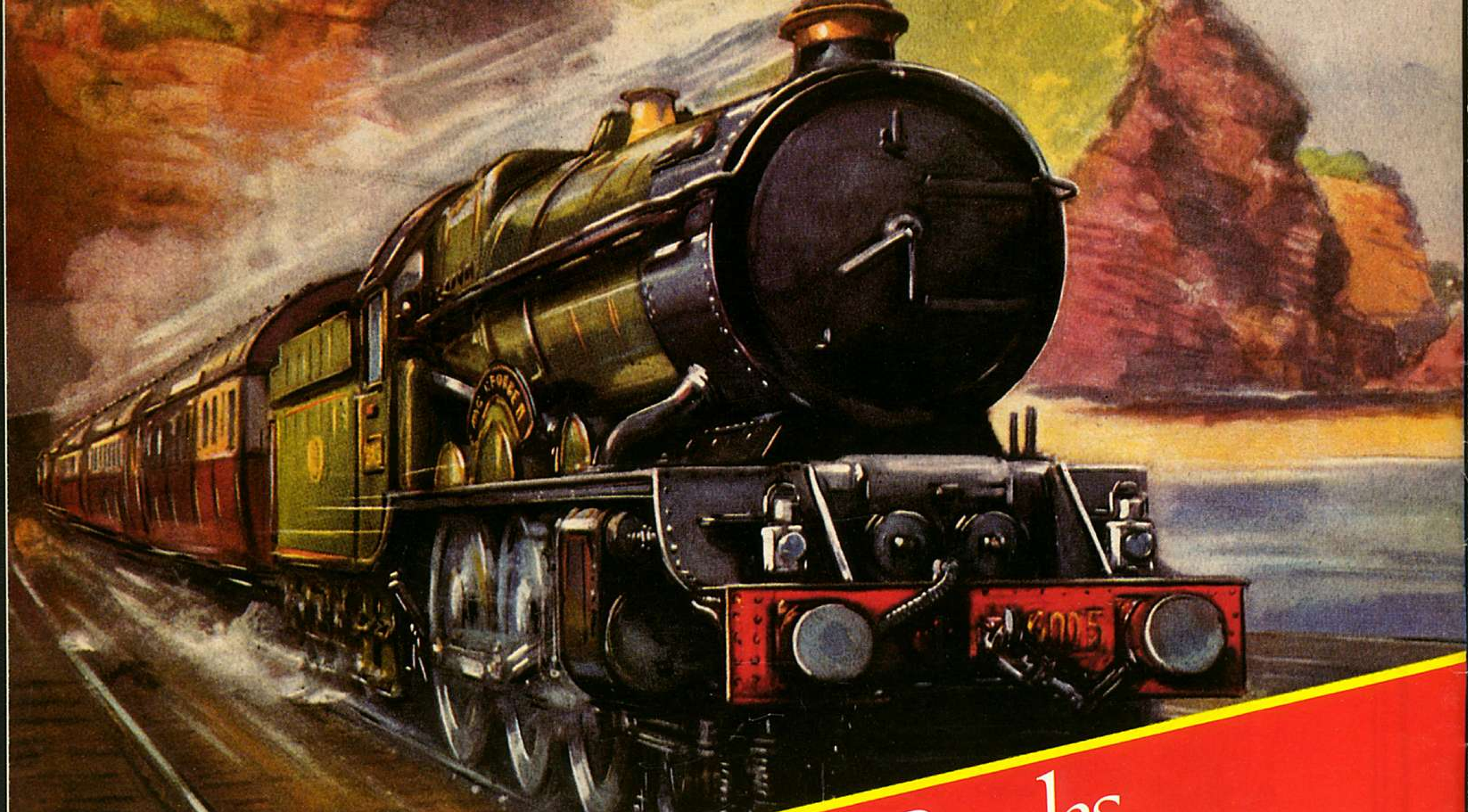

New Cavendish Books Announce 'The Hornby Companion Series'

The Hornby Companion Series will comprise a unique library of seven books dealing with the product history of the legendary Meccano Company founded by Frank Hornby in 1908. The series will be published over the next few years, each volume conforming to an overall size but varying in page and colour content. In an endeavour to make this series as definitive as possible, each volume will be written and compiled by acknowledged experts. The consultant Editor of the series is Mike Nicholls, currently editor of Meccano Magazine. The publishers have access to the finest archival material on the subject, and all this coupled with the standard of quality that has become synonymous with New Cavendish Books, will ensure that these volumes will offer enormous value and pleasure to the readers. It is hoped that over the years they may become as cherished as the products they illustrate.

The Hornby Companion Series: VOLUME 1
The Products of Binns Road – A General Survey – Peter Randall – ISBN 0 904568 06 7. 224 pp, 102 pages full colour, 209 x 292 mm landscape. To be published Spring 1977, at £12.50.

This will form the master Volume to the series and outlines virtually all the products issuing from the various Meccano factories. It includes, for the first time ever, full colour reproductions of the extremely rare Meccano Book of Products – 1934/35, together with a similar reproduction of the Hornby Book of Trains for 1938/39. A full colour extract from the 1939/40 book of trains is also included, dealing with the introduction of Hornby Dublo. In addition to an excellent text, touching on the development of virtually all Meccano's products, the book is profusely illustrated with over 170 black and white reproductions taken mainly from the original Company's literature. The book also includes an invaluable diary of commercial and industrial events.

VOLUME 2: The Meccano Super Models – Geoff Wright. ISBN 0 904568 07 5. Autumn 1977.

VOLUME 3: The History of Hornby Dublo 1938-1964 – Michael Foster.

VOLUME 4: Dinky Toys and Modelled Miniatures – Mike and Sue Richardson.

VOLUME 5: The Hornby 0 Gauge System – Bruce Baxter.

VOLUME 6: A Complete Guide to The Meccano System and The Special Constructional Sets – Jim Gamble.

VOLUME 7: The Hornby Companion – A Digest of Meccano's Advertising and Literature – Mike Nicholls.

This series will be available from most good booksellers.

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